BISHOP MUSEUM BULLETINS IN ENTOMOLOGY

Review of *Sierola* Cameron (Hymenoptera: Bethylidae) of the Hawaiian Islands. Part 2: Hawai‘i

Karl N. Magnacca

Bishop Museum Bulletin in Entomology 16

Bishop Museum Press
Honolulu, 2024

Cover: *Sierola* sp. on ʻōhiʻa lehua at Kīpuka ʻAinahou. Photo: Karl Magnacca.

Published by
Bishop Museum Press
1525 Bernice Street
Honolulu, Hawaiʻi 96817, USA

© the Author(s) and this is an open access article distributed under the terms of the Creative Commons Attribution License 4.0 (CC-BY-NC- SA 4.0), which permits the copying, distribution and transmission of the work as long as the original source is cited.

eISSN 2376-3124 [published online 1 July 2024]
ZooBank Registration:
lsid:zoobank.org:pub:9E880460-2D6A-42BA-8B61-FD37219F7669

Author Contact Information:
Karl N. Magnacca
Department of Natural Sciences, Bishop Museum, 1525 Bernice Street, Honolulu, Hawaiʻi 96817-2704, USA;
email: knm956@gmail.com

TABLE OF CONTENTS

Abstract 5
Introduction 6
Material and Methods 8
Systematics 10
  Key to Species of Hawai‘i Island *Sierola* based on females 10
  Species Accounts 25
    Sierola acaciae, n. sp. 25
    Sierola ahulu, n. sp. 27
    Sierola aiwa, n. sp. 28
    Sierola akakala, n. sp. 31
    Sierola ala, n. sp. 32
    Sierola angustata Fullaway 33
    Sierola atra Fullaway 35
    Sierola aucta Fullaway 36
    Sierola blackburni Fullaway 38
    Sierola carinata Fullaway 40
    Sierola compacta Fullaway 42
    Sierola croceipes Fullaway 44
    Sierola curvignatha Fullaway 45
    Sierola distinctella, n. sp. 46
    Sierola ehrhorni Fullaway 48
    Sierola ekoa, n. sp. 49
    Sierola emarginata Fullaway 51
    Sierola eucrena Fullaway 53
    Sierola fuscipennis Fullaway 55
    Sierola gagneorum, n. sp. 57
    Sierola graciloides, n. sp. 59
    Sierola gruneri, n. sp. 60
    Sierola haleiki, n. sp. 61
    Sierola hawaiiensis Fullaway, n. stat. 63
    Sierola hiwi, n. sp. 65
    Sierola holomelaena Fullaway 66
    Sierola hooneo, n. sp. 68
    Sierola hou, n. sp. 69
    Sierola huinakolu, n. sp. 71
    Sierola huna, n. sp. 73
    Sierola ihunana, n. sp. 74
    Sierola ihupehu, n. sp. 76
    Sierola iki, n. sp. 77
    Sierola iliahi, n. sp. 79
    Sierola illingworthi Fullaway 80
    Sierola imparata Fullaway 81
    Sierola indecora Fullaway 83
    Sierola kaapeha, n. sp. 84
    Sierola kaawale, n. sp. 85
    Sierola kaolo, n. sp. 87
    Sierola kauensis Fullaway 89
    Sierola kepa, n. sp. 90
    Sierola kikanu, n. sp. 92
    Sierola kilauea Fullaway 93

Sierola kohala, n. sp. 96
Sierola koloau, n. sp. 97
Sierola konana Fullaway........ 98
Sierola koolau, n. sp. 100
Sierola kumole, n. sp. 102
Sierola kumukumu, n. sp. 104
Sierola lalahu, n. sp. 105
Sierola larifuga Evans 107
Sierola laticeps Fullaway........ 107
Sierola lepida Fullaway........ 109
Sierola levigata Fullaway........ 110
Sierola longiceps Fullaway 112
Sierola mahana, n. sp. 114
Sierola mahui, n. sp. 116
Sierola mahuna, n. sp. 117
Sierola maiki, n. sp. 119
Sierola makaiki, n. sp. 121
Sierola mamua, n. sp. 123
Sierola mani, n. sp. 124
Sierola mawaena, n. sp. 125
Sierola mealele, n. sp. 127
Sierola megalognatha Fullaway........ 129
Sierola milo, n. sp. 130
Sierola minuta Fullaway 132
Sierola molina, n. sp. 133
Sierola monticola Blackburn & Cameron........ 135
Sierola nemorensis Fullaway 137
Sierola neobrunnea, n. sp........ 138
Sierola newelli Fullaway........ 140
Sierola nigrans Fullaway 142
Sierola nigrescens Fullaway........ 143
Sierola nihoniho, n. sp. 145
Sierola nukupio, n. sp. 146
Sierola okala, n. sp. 148
Sierola oneone, n. sp........ 150
Sierola opakapaka, n. sp........ 151
Sierola osborni Fullaway 153
Sierola pakua, n. sp. 155
Sierola panoa, n. sp. 157
Sierola papalina, n. sp. 159
Sierola papio, n. sp. 160
Sierola perkinsi Fullaway........ 162
Sierola pikale, n. sp. 164
Sierola pili, n. sp. 165
Sierola pohaku, n. sp. 166
Sierola pokii, n. sp. 168
Sierola pololei, n. sp. 169
Sierola puaa, n. sp. 171
Sierola puakii, n. sp........ 173
Sierola puupehu, n. sp. 174
Sierola puuwaawaa Fullaway 176
Sierola rocki Fullaway 179
Sierola scoriacea Fullaway........ 180

Sierola sima Fullaway 182
Sierola sophorae, n. sp. 184
Sierola streblognatha Fullaway 186
Sierola uhapau, n. sp. 187
Sierola uluna, n. sp. 189
Sierola umiumi, n. sp. 191
Sierola unahi, n. sp. 192
Sierola volcanica Fullaway 194
Sierola wahaula, n. sp. 196
Sierola wahiole, n. sp. 198
Sierola winiwini, n. sp. 199
Sierola zimmermani, n. sp. 201
Acknowledgments 202
References 202

ABSTRACT

The species of *Sierola* Cameron from the island of Hawaiʻi are reviewed. Sixty-nine species are described as new: *S. acaciae*, **n. sp.**, *S. ahulu*, **n. sp.**, *S. aiwa*, **n. sp.**, *S. akakala*, **n. sp.**, *S. ala*, **n. sp.**, *S. distinctella*, **n. sp.**, *S. ekoa*, **n. sp.**, *S. gagneorum*, **n. sp.**, *S. graciloides*, **n. sp.**, *S. gruneri*, **n. sp.**, *S. haleiki*, **n. sp.**, *S. hiwi*, **n. sp.**, *S. hooneo*, **n. sp.**, *S. hou*, **n. sp.**, *S. huinakolu*, **n. sp.**, *S. huna*, **n. sp.**, *S. ihunana*, **n. sp.**, *S. ihupehu*, **n. sp.**, *S. iki*, **n. sp.**, *S. iliahi*, **n. sp.**, *S. kaapeha*, **n. sp.**, *S. kaawale*, **n. sp.**, *S. kaolo*, **n. sp.**, *S. kepa*, **n. sp.**, *S. kikanu*, **n. sp.**, *S. kohala*, **n. sp.**, *S. koloau*, **n. sp.**, *S. koolau*, **n. sp.**, *S. kumole*, **n. sp.**, *S. kumukumu*, **n. sp.**, *S. lalahu*, **n. sp.**, *S. mahana*, **n. sp.**, *S. mahui*, **n. sp.**, *S. mahuna*, **n. sp.**, *S. maiki*, **n. sp.**, *S. makaiki*, **n. sp.**, *S. mamua*, **n. sp.**, *S. mani*, **n. sp.**, *S. mawaena*, **n. sp.**, *S. mealele*, **n. sp.**, *S. milo*, **n. sp.**, *S. molina*, **n. sp.**, *S. neobrunnea*, **n. sp.**, *S. nihoniho*, **n. sp.**, *S. nukupio*, **n. sp.**, *S. okala*, **n. sp.**, *S. oneone*, **n. sp.**, *S. opakapaka*, **n. sp.**, *S. pakua*, **n. sp.**, *S. panoa*, **n. sp.**, *S. papalina*, **n. sp.**, *S. papio*, **n. sp.**, *S. pikale* **n. sp.**, *S. pili* **n. sp.**, *S. pohaku*, **n. sp.**, *S. pokii*, **n. sp.**, *S. pololei*, **n. sp.**, *S. puaa*, **n. sp.**, *S. puakii*, **n. sp.**, *S. puupehu*, **n. sp.**, *S. sophorae*, **n. sp.**, *S. uhapau*, **n. sp.**, *S. uluna*, **n. sp.**, *S. umiumi*, **n. sp.**, *S. unahi*, **n. sp.**, *S. wahaula*, **n. sp.**, *S. wahiole*, **n. sp.**, *S. winiwini*, **n. sp.**, and *S. zimmermani*, **n. sp**. One taxon is elevated from a subspecies to a full species, *S. hawaiiensis* Fullaway **n. stat**. Seven prior names are proposed as synonyms: *S. fuscipes* Fullaway **n. syn**. = *S. atra* Fullaway; *S. nubila* Fullaway **n. syn**. = *S. indecora* Fullaway; *S. longicornis* Fullaway **n. syn**. = *S. eucrena* Fullaway; *S. muiri* Fullaway **n. syn**. = *S. konana* Fullaway; *S. notabilis* Fullaway **n. syn**. = *S. sima* Fullaway; and *S. quadriceps* Fullaway **n. syn**., and *S. vulcana* Fullaway **n. syn**. = *S. puuwaawaa* Fullaway. As a result, there are now 108 native plus one introduced species of *Sierola* on Hawaiʻi.

INTRODUCTION

This is the second monograph revising the Hawaiian *Sierola*. The first covered the species of Oʻahu (Magnacca 2020). The present work addresses the 109 species found on the island of Hawaiʻi, which was historically less collected than Oʻahu but nevertheless had a significant number of described species. The faunas of the remaining islands are almost completely undescribed, and the islands of Maui Nui are very poorly sampled.

An overview of the taxonomic history, evolution, and biology of *Sierola* in the Hawaiian Islands was provided in the previous volume (Magnacca 2020), so this introduction is limited to comments on the species of the island of Hawaiʻi. The first species recorded from Hawaiʻi was *S. monticola* Blackburn & Cameron (1886), described from a single specimen. Later in *Fauna Hawaiiensis*, Ashmead (1901) recorded specimens of two new species as well as the three previously monotypic Blackburn & Cameron species from Hawaiʻi. However, as noted earlier (Magnacca 2020), Ashmead was notorious for lumping many species under one name, and none of his identifications are correct (including those of *S. monticola*).

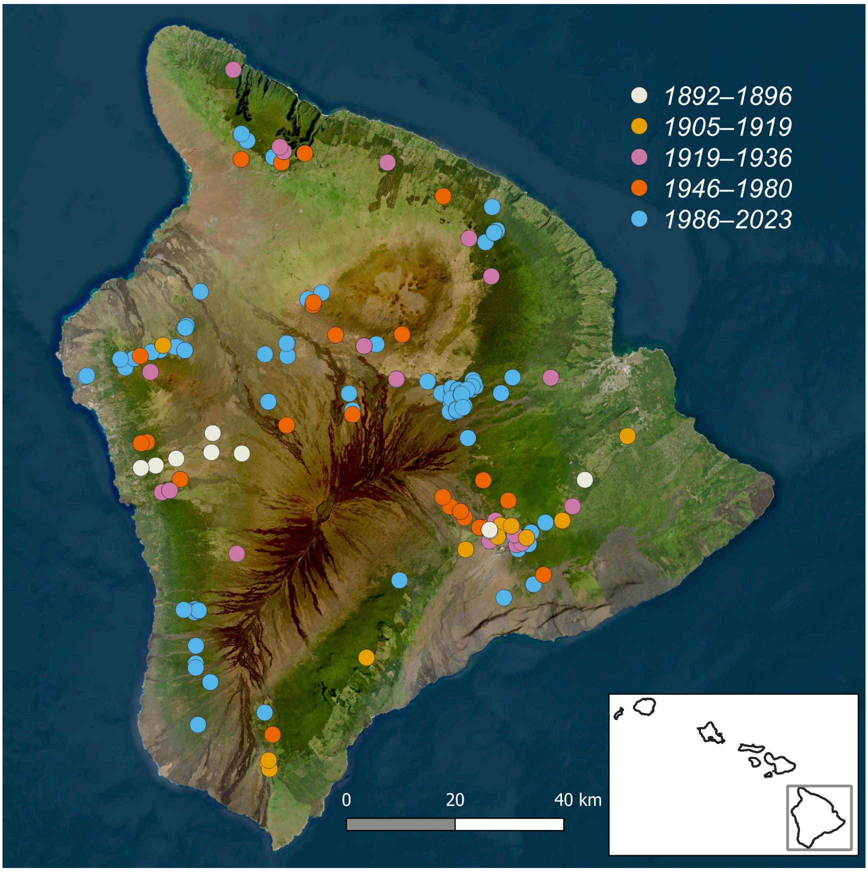
In the last study on them, Fullaway (1920) described 44 new species and one subspecies from Hawaiʻi, significantly fewer than the 118 he described from Oʻahu in the same work but still a large number. However, his work relied almost exclusively on the collections of William M. Giffard and was severely geographically restricted. Of the 88 specimens he examined, 54 came from the vicinity of Kīlauea, 16 from Puʻu Waʻawaʻa, and 10 have no recorded locality; only eight came from scattered localities elsewhere, all of these between Hilo and Kaʻū. Thus the regions of Kona, Mauna Kea (including the saddle with Mauna Loa and the important dry forest area of Pōhakuloa), and Kohala were almost entirely unrepresented. For unknown reasons, Fullaway did not treat the *Fauna Hawaiiensis* collections of R.C.L. Perkins that were deposited at the Bishop Museum, despite having examined the type of *S. dichroma* Perkins there.

The collections of Otto H. Swezey and his contemporaries, beginning even before Fullaway's work was published, greatly expanded the geographic coverage across the island, particularly in Kona and Kohala. Successive collecting periods have filled in missing areas even more, and most of the island is now relatively well sampled (Map 1). However, large areas of wet forest on windward Kohala, Mauna Kea-Mauna Loa, and Kaʻū are still underrepresented. Although productive canopy sampling (see below) has been conducted in some of these sites, the labor-intensive nature of such collections means they have been largely restricted to a few localities, such as the Mauna Loa kīpuka mosaic.

Species delimitation has been much more difficult than for the taxa found on Oʻahu, and quite a few apparent species appear to grade into each other more than expected based on the patterns seen among the Oʻahu species. This is the result of both greater prevalence of intermediate character states (e.g. in the basal wing cell setation), and in individuals that possess mixed characters from two otherwise well-separated species. The latter may be the result of the young age of the island (less than 600,000 years; Clague 1996) allowing less time for related species to diverge. Such a pattern is observed in other groups of both insects and plants (Carson 1982, Johnson *et al*. 2019).

The issue of species delimitation is compounded by the fact that collecting *Sierola* is more difficult on Hawaiʻi than on the older islands. Compared to Oʻahu and Kauaʻi, where a high diversity of *Sierola* can be easily obtained by branch beating, Hawaiʻi has relatively little mesic forest with a diverse subcanopy of low-stature native trees, such as is found in Kōkeʻe and the gulches of the Waiʻanae range. There are large tracts of predominantly native wet forest, but these generally consist of taller forest with a less diverse understory. The understory is often mainly composed of ferns, which are host to relatively few insects, rather than the short angiosperms that prey caterpillars tend to feed on, and where wasps can be easily collected by hand.

Consequently, a high proportion of the more recent collections have come from Malaise trapping and canopy branch clipping samples. Since these are labor-intensive methods, producing large numbers of insect specimens but relatively few bethylids, they are typically done



Map 1. Collection history of Hawai‘i island specimens in this study. Orange markers indicate those used by Fullaway (1920).

as part of broad-scale sampling and in limited locations. Just in the last few years, Malaise trapping in the undersampled Kona region has turned up several species not found elsewhere, along with others not seen in nearly 100 years, indicating that more remain to be discovered.

As in the previous work covering the O‘ahu species (Magnacca 2020), for determining species boundaries I use the phylogenetic species concept as defined by Nixon & Wheeler (1990) and Wheeler & Platnick (2000): the smallest aggregation of populations diagnosable by a unique combination of character states. Although this can lead to over-splitting due to assessing character states as diagnosable due to the small number of individuals or local host races of widespread species, I prefer over-splitting to over-lumping because it retains more information about individuals and populations. In general I have been relatively conservative this treatment, generally refraining from synonymizing existing species that appear to have diagnosability and coherence as taxa. In some cases, as with the difficult complexes related to *S. kilauea* Fullaway and *S. puuwaawaa* Fullaway, this is with the recognition that there are likely to be future revisions to the species concepts involved. At the same time I have been freer in describing new species among the rarer, more unusual forms that had not been treated. For example, I have split *S. haleiki* n. sp. and *S. puupehu* n. sp., and *S. ihupehu* n. sp. and *S. pili* n. sp., two pairs of obviously related taxa that appear to span a greater range of variation than expected for a single species. For unknown reasons, it is difficult to amplify the standard COI “barcode” fragment for the Hawaiian *Sierola* in particular, so DNA has not been useful.

The biology of the species treated here is largely unknown. They are undoubtedly all parasitoids of microlepidopteran caterpillars like the rest of the subfamily, but few specific rearing records are available for Hawai‘i island. Only *S. aiwa* n. sp. and *S. ala* n. sp. have been reared, both from caterpillars of *Hyposmocoma* (Lepidoptera: Cosmopterigidae). Some other species, namely *S. acaciae* n. sp. and *S. puuwaawaa* Fullaway, can occur in numbers and appear to be associated with stands of koa (*Acacia koa*) trees; they may attack seed-feeding caterpillars such as *Cryptophlebia* and *Cydia* (Olethreutidae). One of the few species that can be collected in large number by sweeping low vegetation, *S. pololei* n. sp., may be associated with ferns; it is often found in areas with high densities of *Dryopteris*.

MATERIAL AND METHODS

Holotypes of all previously-described *Sierola* species were examined, except for the ten species from East and South Asia. A total of 1,737 Hawai‘i specimens were examined, in the collections of the Bernice Pauahi Bishop Museum, Honolulu (BPBM), including specimens originally in the Hawaii Sugar Planters’ Association collection, ‘Aiea (HSPA); Hawai‘i Department of Agriculture, Honolulu (HDOA); University of Hawai‘i at Mānoa, Honolulu (UHIM); University of California at Riverside (UCRC); Smithsonian National Museum of National History, Washington D.C. (USNM); and the Natural History Museum, London (NHMUK). Specimens from the U.S. Geological Survey Pacific Island Ecosystems Research Center (PIERC) and University of Maryland, College Park (UMD) were examined, and significant material (mainly types and paratypes) deposited in the institutions above. Some specimens from recent collections have been retained in my personal collection (KNMC) in anticipation of future genetic study. A full table of specimens is listed in the Supplementary Data. Comments and clarifications (e.g. spelling corrections, updated taxonomy) are in square brackets; all other text is from the label. Specimen data in the Supplementary Data is transcribed as-is, without Hawaiian diacritics.

Morphological data for all species were entered in DELTA (Dallwitz 1980, Dallwitz *et al.* 2000), using the Open DELTA implementation (Atlas of Living Australia 2011). Males are not treated; the head modifications used to separate the females (which are presumably involved in prey capture) are generally lacking or less extreme, and with many rare species occurring sympatrically, most males are difficult to associate with females (Magnacca 2020). Males of Bethylinae are generally poorly studied compared to other subfamilies. Morphological terminology follows Magnacca (2020; see Morphology section and Figures 1–10). Morphometric measurements of holotypes are given for all species; for selected taxa where more precision was required, larger samples (or all available specimens) were measured for major characters, and these are presented as ranges. Morphometrics follows Magnacca (2020), using the following abbreviations (Figure 1): head length (LH), head depth (DH), eye-vertex distance (EV), eye height (HE), head width (WH), frons width (WF),width of the ocellar triangle (WOT), ocellar-ocular length (OOL), third antennal segment (A3, first flagellomere) length/width, fore femur length (FL) and width (FW), hind femur length (HFL) and width (HFW), mesosoma length (LM), mesosoma depth (DM), length of the fore wing (LFW), fore wing cell 2R1 length/width. Aside from LM and LFW, these are recorded as the ratios DH/LH, WH/LH, EV/HE, EV/WF, WF/HE, WH/WF, OOL/WOT, A3 L/W, DM/LM, FL/FW, HFL/HFW, and 2R1 L/W. Measurements were taken with an Olympus SZ61 dissecting microscope at 67.5× or 90× using an eyepiece micrometer with a tick length of 0.0146 mm.

Specimens were imaged at BPBM using a Leica LAS montage system, images combined into a focus stack using CombineZP (Hadley 2010) or Helicon Focus 8 (Helicon Soft Ltd.), and artifacts removed and levels adjusted using Adobe Photoshop. The head of each was photographed from the side, top, and an angle from the front to capture the mandibles, along with a lateral habitus. All of the images are of holotypes, and head images at the same scale except for the dorsal view of *S. fuscipennis*.

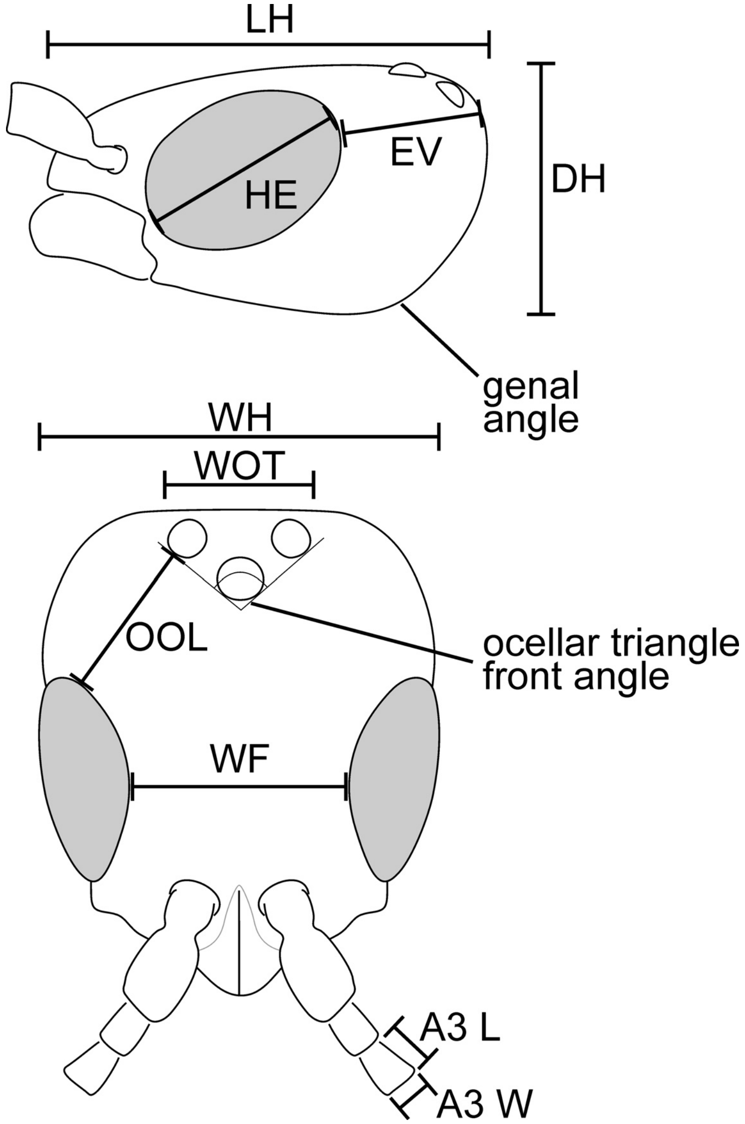


Figure 1. Head measurements, shown on a stylized generic *Sierola*. LH: length of head; DH: depth of head; WH: width of head; EV: eye-vertex distance; HE: height (= length) of eye; WF: width of frons; WOT: width of ocellar triangle; OOL: ocellar-ocular length; A3 L: length of third antennal segment (= first flagellar segment); A3 W: width of third antennal segment.

Locality coordinates are accurate to within about 10–30 m for recent collections (since 2010). For older collections, sites on the maps are estimated based on the locations of trails and known collecting areas. These may be significantly off in elevation and precise locality (up to 1–3 km), especially where elevation data is not on the label. Specimens with only very general information such as “S. Kona” were not mapped.

SYSTEMATICS

Sierola Cameron

Type species: *Sierola testaceipes* Cameron, 1881, by monotypy.

Diagnosis.

Small to medium sized bethylids, 1.7–6.2 mm long. Defined principally by wing venation, with cell 1M (areolet of earlier workers) present and cell 2R1 (radial cell) closed or nearly so, the distal portion of vein Rs bent toward the anterior wing margin at a right angle or more, and without a closed 1R1 (submarginal cell). All known species macropterous and flighted. Palpal formula 4: 2. Clypeus variable: typically with median lobe moderately elongate, triangular to semicircular, and with a sharp dorsal carina; often highly modified in various shapes or shortened, sometimes nearly transverse and hardly longer than lateral lobes, and/or convex or flat dorsally. Mandible usually with four teeth, uppermost broad and blunt, others pointed; sometimes falcate or teeth otherwise reduced; mandible occasionally highly modified. Eye setae almost always present but usually short, sparse, and inconspicuous. Parapsidal lines present, notauli absent. Mesosoma lacking any protuberances or distinctive sculpting. Propodeum without pits, rarely with median carina, never with submedian propodeal carinae; posterior transverse carina sometimes present in Asian and Australian species, usually absent in Oceanian species; lateral marginal carina variable but usually well developed. Fore and hind femora swollen and convex dorsally, 1.6–2.5 and 1.8–3.1 times as long as wide, respectively. Metasoma mostly lacking distinctive features; petiole ventrally with complete median carina, tergites typically polished, sometimes with smooth microreticulation, only rarely with distinct microsculpture. Male genitalia not examined in detail, much smaller than in most comparable-sized *Goniozus*. Sting apparatus also not examined.

Taxonomy is based on females as males are often difficult to associate due to more generalized structure and a large number of similar sympatric species.

Key to species of Hawai‘i Island *Sierola*, based on females

Shortcuts to major groups (a few species skipped):
Clypeus without distinct, sharp carina
    Clypeus flat or convex dorsally, not at all carinate **5**
    Clypeus dorsally angulate, weakly carinate, or with a rounded carina **28**
Clypeus with a distinct, sharp carina
    Mandible broad, not at all narrowed from base **57**
    Mandible not extremely broad
        Basal wing cells sparsely setose to glabrous **64**
        Basal wing cells densely setose **91**

1. Clypeus dorsally flat, rounded, angulate (weakly carinate), or faintly carinate at the base only **2**

–. Clypeus dorsally with distinct, sharp carina, sides slightly to strongly concave **56**

2 (1). Mandible distinctly bent down at base, crossing in X when closed, thin, laminate, apically truncate and without obvious teeth, scissors-like (Fig. 75) .... ***S. nigrescens*** Fullaway

–. Mandible sometimes with cutting plane twisted but not bent down at base, overlapping broadly at tips, not thin and laminate **3**

3 (2). Clypeus narrow, rostrate; head nearly flat ventrally, wider than long and strongly laterally compressed, WH/LH 0.99–1.06, DH/LH 0.43–0.49; vertex broadly, shallowly concave (Fig. 25) .... ***S. hawaiiensis*** Fullaway

–. Clypeus at least moderately broad; head usually convex or angulate ventrally, never both very wide and strongly compressed; vertex usually straight or only very slightly concave **4**

4 (3). Clypeus flat or convex dorsally, without a trace of a carina (Figs. 2, 18, 52) **5**
–. Clypeus dorsally at least somewhat angulate, weakly carinate or with a rounded carina (Figs. 9, 30, 46, 47) **28**

5 (4). Basal wing cells nearly glabrous **6**
–. Basal wing cells sparsely to densely setose **15**

6 (5). Mandible falcate or with a single large ventral tooth and a few minute dorsal ones, mandible apex usually strongly oblique (Figs. 2D, 52D); malar space distinct, at least 1/4 as long as base of mandible **7**
–. Mandible with four distinct teeth, more or less similar in size or with the ventral or second ventral tooth only slightly larger, rarely with all minute teeth but never falcate with a very strong ventral tooth; mandible apex usually vertical, rarely slightly oblique; malar space usually absent or nearly so **11**

7 (6). Mandible falcate, without subapical teeth; clypeus evenly sloping to slightly curved in profile, somewhat elongate; frons moderately punctate, 1–3 pit widths apart .... ***S. acaciae*** **n**. **sp**.
–. Mandible with three small, widely spaced subapical teeth; clypeus short and steeply curved in profile; frons sparsely punctate, over 3 pit widths apart **8**

8 (7). Clypeus bulbous, expanded beyond base and strongly convex, rounded all around apically (Fig. 52); mandible enlarged and convex preapically, twisted at apex; metasoma mostly polished, tergites without distinct microsculpture except laterally .... ***S. lalahu*** **n**. **sp**.
–. Clypeus either moderately convex dorsally and narrowed toward apex, or mostly flat and spatulate with apex truncate; mandible twisted but not convex; metasoma usually with at least faint microsculpture medially **9**

9 (8). Clypeus semicircular, convex dorsally, apex broadly rounded; mandible moderately narrow, distinctly concave ventrally; vertex in dorsal view straight; ocellar triangle front angle weakly acute; OOL/WOT 1.30–1.55; fore femur narrow, FL/FW >2.20 (Fig. 15) .... ***S. distinctella*** **n**. **sp**.
–. Clypeus spatulate, flat dorsally, apex truncate (Figs. 33, 88); mandible moderately broad, more or less parallel-sided; vertex in dorsal view at least narrowly concave; ocellar triangle front angle strongly acute; OOL/WOT >1.60; fore femur broader, FL/FW <2.10 .... **10**

10 (9). Dorsum of head in lateral view strongly convex; genal angle prominent, head distinctly triangular in lateral view; lateral ocelli nearly touching vertex; vertex broadly, shallowly concave (Fig. 33) .... ***S. ihupehu*** **n**. **sp**.
–. Dorsum in head in lateral view nearly flat posterior to eyes; genal angle present posteriorly but not prominent, relatively flat ventrally in lateral view; lateral ocelli distinctly separate from vertex; vertex with only a narrow, shallow emargination between ocelli (Fig. 88) .... ***S. pili*** **n**. **sp**.

11 (6). Head moderately narrow and long posterior to eyes, WH/LH 0.80–0.86, EV/HE >1.10, OOL/WOT 1.40–1.60; frons with finely microreticulate sculpture; ocellar triangle weakly acute; metasoma with smooth but distinct microreticulation over all terga; femora extremely narrow, FL/FW >2.50, HFL/HFW >2.80 .... ***S. iliahi*** **n**. **sp**., in part
–. Head broad and shorter posterior to eyes, WH/LH 0.86–1.02, EV/HE <0.95, OOL/WOT <1.40; frons microsculpture evident but smooth; ocellar triangle right to obtuse; metasoma usually polished except at lateral margins, medially at most with very faint microreticulation **12**

12 (11). Mandible, coxae, and femora dark brown to black **13**
–. Mandible yellow, coxae and femora predominantly yellow, brown only on dorsal margins **14**

13 (12). Head evenly convex ventrally, genal angle absent, DH/LH 0.50–0.54 (Fig. 5B); ocellar triangle right to weakly acute; hind femur very broad, HFL/HFW ~1.8 .... ***S. akakala*** **n**. **sp**.
–. Head ventrally with prominent genal angle, DH/LH 0.60–0.64 (Fig. 100B); ocellar triangle strongly obtuse; hind femur moderately narrow, HFL/HFW ~2.5 .... ***S. streblognatha*** Fullaway

14 (12). Clypeus dorsally flat; vertex broadly, shallowly concave; head not as deep, DH/LH ~0.58 (Fig. 89) .... ***S. pohaku*** **n**. **sp**.
–. Clypeus dorsally convex; vertex more or less straight; head deeper, DH/LH 0.61–0.66 (Fig. 96) .... ***S. rocki*** Fullaway

15 (5). Mandible strongly twisted (Figs. 14, 48, 105); ocellar triangle front angle distinctly acute **16**
–. Mandible not or only slightly twisted, or if somewhat strongly twisted then ocellar triangle front angle obtuse to right **18**

16 (15). Frons narrower, WF/HE <1.20 (Fig. 14A); malar space small, at most 1/4 as long as base of mandible .... ***S. curvignatha*** Fullaway
–. Frons broad, WF/HE >1.25 (Figs. 48A, 105A); malar space 1/3 as long as base of mandible **17**

17 (16). Clypeus in profile evenly sloping or weakly curved; head narrower, WH/LH 0.78–0.86, and longer posterior to eye, EV/HE 0.85–1.05, OOL/WOT 1.65–1.90; coxae and femora dark brown (Fig. 105) .... ***S. volcanica*** Fullaway
–. Clypeus in profile strongly curved; head broader, WH/LH 0.88–0.94, DH/LH 0.51–0.56, and shorter posterior to eye, EV/HE 0.70–0.85, OOL/WOT 1.45–1.65; fore and mid femora usually yellow except dorsal margins (sometimes all brown; Fig. 48) .... ***S. konana*** **n**. **sp**.

18 (15). Clypeus strongly convex dorsally, in lateral view evenly curved (Figs. 32, 92); OOL/WOT 1.05–1.45 .... **19**
–. Clypeus flat or only weakly convex dorsally, in lateral view variable but often evenly sloping, nearly straight; OOL/WOT variable, often either larger or smaller....... **23**

19 (18). Head deep, DH/LH ≥0.62, distinctly angulate ventrally in lateral view; frons broad, WF/HE 1.25–1.32; mandible orange to reddish brown (Fig. 62) .... ***S. mamua*** **n**. **sp**., in part
–. Head always evenly convex ventrally in lateral view, and usually not so deep (DH/LH ≤0.61 except in *S. puupehu* n. sp.); frons narrower, WF/HE <1.25; mandible variable, often black (Figs. 32, 92, 94) **20**

20 (19). Clypeus broadly convex, with conspicuous setae apically (Fig. 92); lateral ocelli distinctly separate from vertex crest; head ventrally with moderately dense pubescence; mandible reddish brown to orange .... ***S. puaa*** **n**. **sp**.
–. Clypeus with rounded ridge dorsally, setae small and inconspicuous (Figs. 32, 94); lateral ocelli indistinctly separate from or touching vertex crest; mandible variable **21**

21 (20). Mandible black, second ventral tooth longest, convex outwardly; head more strongly convex dorsally, ventrally with sparse setae, posterior corners strongly rounded off (Fig. 32) .... ***S. ihunana*** **n**. **sp**., in part
–. Mandible black to reddish brown, ventral tooth longest, twisted, not convex outwardly; head weakly convex dorsally, ventrally with somewhat dense setae, posterior corners distinct (Figs. 24, 94) **22**

22 (21). Head parallel-sided posterior to eyes, more elongate, EV/HE ~0.82, OOL/WOT ~1.36; ventrally only moderately convex and not so deep, DH/LH ~0.59; femora narrow, FL/FW ~2.21, HFL/HFW ~2.48 (Fig. 32) .... ***S. haleiki*** **n**. **sp**., in part

–. Head rounded shortly posterior to eyes, EV/HE ~0.64, OOL/WOT ~1.17; ventrally strongly convex and deeper, DH/LH ~0.64; femora broader, FL/FW ~2.07, HFL/HFW ~2.25 (Fig. 94) .... ***S. puupehu*** **n**. **sp**., in part

23 (18). Vertex in dorsal view deeply concave; ocellar triangle strongly obtuse and very wide, WOT > OOL; clypeus flat dorsally; frons moderately punctate, 1–3 pit widths apart (Fig. 18) .... ***S. emarginata*** Fullaway

–. Vertex in dorsal view straight to shallowly concave; ocellar triangle weakly obtuse to weakly acute, OOL/WOT >1.05 .... **24**

24 (23). Head triangular in dorsal view, broadest posterior to eyes; frons with scutellate microsculpture, appearing dull at low magnification but each cellule separately convex and shining within, distinctly different from sculpture of rest of head; wing membrane slightly infuscate; dorsum of head nearly flat in lateral view (Fig. 104) .... ***S. unahi*** **n**. **sp**.

–. Head more ovate, broadest across the eyes; frons with fine to smooth microsculpture, weakly to strongly shining (if somewhat scutellate then similar on the lateral and ventral surfaces); wing membrane usually hyaline, at most faintly tinged with yellow; dorsum of head usually weakly to strongly convex in lateral view **25**

25 (24). Mandible black to reddish brown, moderately narrow, distinctly concave ventrally, with at least ventral tooth large and conspicuous (Fig. 22D); frons punctation distinct, 1–3 pit widths apart; OOL/WOT <1.40 .... **26**

–. Mandible yellow, narrow, with minute, indistinct teeth (Figs. 7D, 35D); frons punctation obscure, appearing impunctate; OOL/WOT >1.40 .... **27**

26 (25). Head moderately broad and deep, DH/LH 0.54–0.58, WH/LH 0.78–0.87; dorsum of head convex in lateral view; basal wing cells densely setose; legs all yellow (Fig. 22) .... ***S. graciloides*** **n**. **sp**.

–. Head compressed and narrow, DH/LH 0.47–0.51, WH/LH 0.72–0.80; dorsum of head flat in lateral view; basal wing cells with intermediate setation; coxae and femora brown (Fig. 85) .... ***S. papio*** **n**. **sp**.

27 (25). Head narrow, compressed, and elongate, DH/LH 0.48–0.52, WH/LH 0.67–0.75, EV/HE >1.00 (Fig. 7); basal wing cells densely setose; metasoma polished, without microsculpture .... ***S. angustata*** Fullaway

–. Head broader and deeper, DH/LH 0.57–0.61, WH/LH 0.79–0.87, EV/HE <1.00 (Fig. 35); basal wing cells sparsely setose to nearly glabrous; metasoma with smooth but distinct microsculpture over all terga .... ***S. iliahi*** **n**. **sp**., in part

28 (4). Clypeus enlarged, quadrate, broad and rounded apically, or elongate trapezoidal (Figs. 4A, 98A, 108A) **29**

–. Clypeus normal, triangular, semicircular, semi-elliptical, or short-trapezoidal (e.g. Figs. 43A, 47A, 59A) **31**

29 (28). Clypeus elongate trapezoidal, apex narrowly transverse; mandible narrow, distinctly concave ventrally; lateral ocelli separated from vertex crest by less than their diameter; head shorter posterior to eyes, EV/HE usually <1.00; OOL/WOT 1.30–1.60 (Fig. 108) .... ***S. winiwini*** **n**. **sp**.

–. Clypeus broad, parallel-sided, apex rounded or broadly truncate (Figs. 4A, 98A); mandible broad to moderately broad; lateral ocelli separated from vertex crest by about their diameter; head usually longer posterior to eyes, EV/HE >0.95; OOL/WOT >1.70 .... **30**

30 (29). Clypeus quadrate, truncate apically, in profile evenly sloping, nearly straight; mandible reddish brown; A3 short, about as long as wide (Fig. 98) .... ***S. sima*** Fullaway

–. Clypeus broad and elongate, semicircular and rounded apically, in profile evenly curved; mandible black; A3 distinctly longer than wide (Fig. 4) .... ***S. aiwa*** **n**. **sp**.

31 (28). Mandible reddish brown to yellow **32**

–. Mandible black **40**

32 (31). Clypeus in profile short, strongly rounded and slightly recurved, almost semicircular apically (Fig. 59B); frons microsculpture minutely scutellate, cellules distinct; basal wing cells nearly glabrous except a few setae near the apex ...... ***S. mahuna*** **n**. **sp**.

–. Clypeus in profile various, but if recurved apically then relatively high (Fig. 106B); frons microsculpture smooth to coriaceous, without conspicuous but shining cellules; basal wing cells usually at least sparsely setose **33**

33 (32). Clypeus trapezoidal, apex truncate; frons coriaceous, densely punctate between the eyes; vertex slightly sinuate around ocelli; head in lateral view strongly convex dorsally and deep, DH/LH 0.61–0.67; basal wing cells densely setose; legs all yellow (Fig. 43) .... ***S. kepa*** **n**. **sp**., in part

–. Clypeus rounded triangular to semi-elliptical; frons smooth to finely microreticulate, moderately punctate throughout, 2–3 pit widths apart; vertex not sinuate around the ocelli, straight or very slightly concave; head in lateral view weakly convex dorsally and usually not so deep, DH/LH 0.51–0.59 except in *S. mamua*; basal wing cells variable but usually sparsely setose; coxae and femora often dark brown to black **34**

34 (33). Head distinctly narrow, WH/LH <0.78; malar space distinct, at least 1/4 as long as base of mandible; frons punctation indistinct below, obscured by microsculpture which is dull between eyes, distinctly smoother above; mandible twisted; head ventrally with moderately dense pubescence (Fig. 83) .... ***S. panoa*** **n**. **sp**., in part

–. Head broader, WH/LH >0.82; malar space very small to absent, <1/4 as long as base of mandible; frons with distinct punctures; microsculpture of various forms but similar across the dorsal head; mandible sometimes strongly convex outwardly but not twisted; head with sparse setae ventrally **35**

35 (34). Clypeus strongly rounded and recurved apically in lateral view; mandible moderately broad; vertex slightly concave; head broadened posterior to eyes; OOL/WOT >1.45 (Figs. 31, 106) **36**

–. Clypeus evenly curved or nearly straight in lateral view; mandible narrow to moderately narrow; vertex more or less straight; head parallel-sided posterior to eyes or short and rounded; OOL/WOT <1.45 .... **37**

36 (35). Mandible almost parallel-sided, scarcely expanded towards apex; frons setae distinctly elongate, about twice as long as flagellum width; fore femur not so narrow, FL/FW 2.05–2.30 (Fig. 106) .... ***S. wahaula*** **n**. **sp**., in part

–. Mandible strongly expanded towards apex; frons setae short, only about as long as flagellum width; fore femur very narrow, FL/FW ~2.50 (Fig. 31) .... ***S. huna*** **n**. **sp**., in part

37 (35). Mandible narrow, more or less parallel-sided; lateral ocelli distinctly separated from vertex; basal wing cells nearly glabrous; metasoma shining, with faint microsculpture only laterally (Fig. 51) .... ***S. kumukumu*** **n**. **sp**.

–. Mandible moderately narrow, distinctly concave ventrally; lateral ocelli nearly touching vertex; basal wing cells sparsely setose; metasoma variable **38**

38 (37). Head compressed, relatively flat ventrally, DH/LH 0.54–0.58, in dorsal view parallel-sided for some distance posterior to eyes; OOL/WOT >1.25; ocellar triangle right; femora broad, FL/FW <2.00, HFL/HFW <2.45, fore femur biconvex (Fig. 67) .... ***S. milo*** **n**. **sp**.

–. Head deep and strongly convex or angulate ventrally, DH/LH 0.61–0.66, rounded shortly posterior to eyes, OOL/WOT <1.25 (Figs. 50B, 62B); ocellar triangle weakly to strongly obtuse; femora narrow, FL/FW >2.00, HFL/HFW >2.45, fore femur compressed, slightly arcuate in dorsal view **39**

39 (38). Clypeus in profile evenly sloping, nearly straight; head strongly convex and rounded ventrally, genal angle absent; metasoma polished, with faint microsculpture only laterally (Fig. 50) .... ***S. kumole*** **n**. **sp**.

–. Clypeus in profile curved to apex; genal angle distinct; metasoma shining but often with at least faint microreticulation over all terga (Fig. 62) .... ***S. mamua*** **n**. **sp**., in part

40 (31). Mandible massive, thick, strongly elbowed; basal wing cells nearly glabrous; frons broad, WF/HE ~1.5; OOL/WOT 1.70–2.00 (Fig. 66) ... ***S. megalognatha*** Fullaway

–. Mandible variable, if moderately broad then not thick and massive, evenly curved in ventral view; basal wing cells densely setose; frons narrow, WF/HE ~1.0–1.1; OOL/WOT 1.05–1.35 .... **41**

41 (40). Large species, head massive and long posterior to eyes, EV/HE >1.15; ocellar triangle strongly acute, lateral ocelli separated from vertex by more than an ocellus length; clypeus broadly truncate apically, evenly sloping in profile (Fig. 9) .... ***S. aucta*** Fullaway

–. Small to medium species, head not so large, EV/HE <1.10; lateral ocelli separated from vertex by at most an ocellus length, usually less, ocellar triangle usually weakly acute to weakly obtuse; clypeus rounded apically, curved in profile **42**

42 (41). Genal angle prominent, head distinctly triangular in lateral view (Figs. 41B, 46B); postgenal depression distinct though sometimes shallow; head very deep, DH/LH 0.63–0.69; antenna longer, A3 distinctly longer than wide; hind femur narrow, HFL/HFW usually >2.35 .... **43**

–. Genal angle weak, head generally convex ventrally, not distinctly triangular in lateral view (Figs. 3B, 47B, 94B); postgenal depression very shallow, nearly absent; head usually not as deep, DH/LH 0.53–0.63 (except deeper in *S. puupehu* n. sp.); antenna short, A3 about as long as wide or wider; hind femur broad, HFL/HFW usually <2.30 .... **44**

43 (42). Frons moderately punctate, punctures irregularly 1–3 pit widths apart; mandible moderately broad, weakly concave ventrally, not twisted but strongly convex outwardly (Fig. 41) .... ***S. kaolo*** **n**. **sp**.

–. Frons sparsely punctate, mostly 3 pit widths apart or more, some closer near the antennae; mandible moderately narrow, distinctly concave ventrally, twisted (Fig. 46) .... ***S. kohala*** **n**. **sp**.

44 (42). Clypeus elongate and weakly curved in profile, apical angle strongly acute; head somewhat compressed, DH/LH 0.48–0.52 (Fig. 47) .... ***S. koloau*** **n**. **sp**.

–. Clypeus more strongly curved in profile, forming a quarter-circle or more, apical angle right or greater (Figs. 3B, 21B); head deeper, DH/LH >0.52, usually >0.57 ..... **45**

45 (44). Frons broad, WF/HE >1.15 .... **46**

–. Frons narrow, WF/HE <1.15 .... **50**

46 (45). Clypeus in profile strongly rounded and recurved apically; mandible distinctly convex outwardly; vertex very slightly concave (Fig. 106) **47**

–. Clypeus in profile evenly or steeply curved, not recurved apically; mandible flat or only weakly convex outwardly; vertex usually straight **48**

47 (46). Mandible almost parallel-sided, scarcely expanded towards apex; frons setae distinctly elongate, about twice as long as flagellum width; fore femur not so narrow, FL/FW 2.05–2.30 (Fig. 106) .... ***S. wahaula*** **n**. **sp**., in part

–. Mandible strongly expanded towards apex; frons setae short, only about as long as flagellum width; fore femur very narrow, FL/FW ~2.50 (Fig. 31) .... ***S. huna*** **n**. **sp**., in part

48 (46). Head in lateral view strongly convex dorsally, with moderately dense setae ventrally; lateral ocelli nearly touching vertex; basal wing cells sparsely setose; antenna short, A3 as wide or wider than long (Fig. 3) .... ***S. ahulu*** **n**. **sp**.

–. Head in lateral view weakly convex dorsally, with sparse setae ventrally; lateral ocelli distinctly separate from vertex crest; basal wing cells densely setose; antenna longer, A3 distinctly longer than wide **49**

49 (48). Clypeus in profile steep, apex right; mandible moderately narrow; ocellar triangle weakly acute, OOL/WOT <1.45; head broader, WH/LH usually >0.85 (Fig. 21) ... . ***S. gagneorum*** **n**. **sp**.

–. Clypeus in profile evenly curved, apex acute; mandible broad; ocellar triangle strongly acute, OOL/WOT >2.00; head narrower, WH/LH usually <0.85 (Fig. 107) .... ***S. wahiole*** **n**. **sp**.

50 (45). Frons microsculpture heterogeneous, minutely colliculate below middle of eyes, finely microreticulate above (Fig. 78) .... ***S. okala*** **n**. **sp**.

–. Frons microsculpture even, coriaceous to finely microreticulate **51**

51 (50). Frons minutely scutellate, appearing somewhat dull, obscuring punctation (Fig. 29) .... ***S. hou*** **n**. **sp**.

–. Frons smooth to finely microreticulate, punctation distinct **52**

52 (51). Clypeus in profile short and steeply curved (Fig. 17B); ocellar triangle acute; fore femur narrow, FL/FW ~2.40, hind femur broader .... ***S. ekoa*** **n**. **sp**.

–. Clypeus in profile evenly curved (Figs. 30B, 94B); ocellar triangle right to slightly obtuse; fore femur not so narrow, FL/FW <2.35, hind femur always narrower **53**

53 (52). Posterior corners of head strongly rounded off; mandible narrow, distinctly convex outwardly (Fig. 32) .... ***S. ihunana*** **n**. **sp**., in part

–. Posterior corners of head rounded but distinct; mandible narrow to moderately narrow and twisted, not strongly convex outwardly **54**

54 (53). Vertex crest narrow, forming a distinct angle with occiput in lateral view; mandible moderately narrow, with equally strong teeth, only slightly twisted, always black (Fig. 30) .... ***S. huinakolu*** **n**. **sp**.

–. Vertex crest strongly rounded, evenly curved to occiput in lateral view; mandible narrow, ventral tooth distinctly larger than others, strongly twisted, often reddish brown (Figs. 24, 94) **55**

55 (54). Head parallel-sided posterior to eyes, more elongate, EV/HE ~0.82, OOL/WOT ~1.36; ventrally only moderately convex and not so deep, DH/LH ~0.59; femora narrow, FL/FW ~2.21, HFL/HFW ~2.48 (Fig. 24) .... ***S. haleiki*** **n**. **sp**., in part

–. Head rounded shortly posterior to eyes, EV/HE ~0.64, OOL/WOT ~1.17; ventrally strongly convex and deeper, DH/LH ~0.64; femora broader, FL/FW ~2.07, HFL/HFW ~2.25 (Fig 94) .... ***S. puupehu*** **n**. **sp**., in part

56 (1). Mandible broad, not narrowed from the articulation, parallel-sided or only slightly concave ventrally, rarely broadening towards the apex (Figs. 8D, 11D, 101D); head evenly convex ventrally **57**

–. Mandible moderately broad to narrow, always at least slightly narrowed from the articulation, often distinctly concave ventrally; head below variable, often genal angle present **63**

57 (56). Clypeus in lateral view weakly sloping at the base, strongly rounded and recurved apically (Fig. 11B) **58**

–. Clypeus in lateral view evenly sloping or slightly curved (Figs. 8B, 10B, 101B) **59**

58 (57). Head ventrally with moderately dense pubescence; basal wing cells densely setose; mandible twisted; head narrower and longer posterior to eyes, WH/LH <0.89, EV/HE >1.00 .... ***S. carinata*** Fullaway
–. Head ventrally with sparse pubescence; basal wing cells with intermediate or sparse station; mandible flat or slightly convex outwardly, not twisted; head wider and shorter posterior to eyes, WH/LH >0.90, EV/HE <1.00 .... ***S. osborni*** Fullaway

59 (57). Head ventrally with dense, downy pubescence; head broad, deep, and long posterior to eyes, WH/LH 0.83–0.91, DH/LH 0.56–0.60, EV/HE 1.05–1.25, OOL/WOT 1.90–2.15; legs predominantly yellow, femora tinged with brown (Fig. 103) .... ***S. umiumi* n. sp.**
–. Head ventrally with sparse pubescence; head either broad and deep or long posterior to eyes, not both; leg coloration variable **60**

60 (59). Legs all dark brown; head broader and deeper, WH/LH 0.83–0.91, DH/LH 0.57–0.61, but shorter posterior to eyes, OOL/WOT 1.55–1.90; frons microsculpture coriaceous, moderately dull .... ***S. atra*** Fullaway
–. At least tibiae yellow, often femora predominantly yellow; head narrower and more compressed, WH/LH <0.84, DH/LH <0.57, and longer posterior to eyes, OOL/WOT 1.95–2.25; frons microsculpture finely reticulate, somewhat shining **61**

61 (60). Head and body somewhat flattened; head very narrow and compressed, DH/LH ~0.49, WH/LH ~0.72 (Fig. 69) .... ***S. molina* n. sp.**, in part
–. Head and body robust; head broader and deeper, WH/LH 0.78–0.84, DH/LH 0.53–0.57 .. **62**

62 (61). Femora very narrow, FL/FW 2.25–2.45, HFL/HFW >2.50; fore and mid femora predominantly yellow, hind femur brown; frons broad, WF/HE 1.25–1.40 .... ***S. uhapau* n. sp.**
–. Femora not so narrow, FL/FW 2.00–2.20, HFL/HFW <2.50; all femora dark brown to black; frons narrower, WF/HE <1.20 .... ***S. blackburni*** Fullaway

63 (56). Basal wing cells sparsely setose to glabrous, rarely with the apex of cell R densely setose **64**
–. Basal wing cells densely setose **91**

64 (63). Clypeus elongate, triangular or trapezoidal, in profile evenly sloping dorsally (sometimes slightly recurved apically); head strongly convex ventrally, with moderately dense setae (Fig. 84) .... ***S. papalina* n. sp.**
–. Clypeus shorter, semicircular to semi-elliptical, in profile distinctly curved (Figs. 13B, 39B, 65B); head variable ventrally but usually not both strongly convex and conspicuously setose **65**

65 (64). Mandible yellow; posterior corners of head strongly rounded off in dorsal view; genal angle distinct, broadly rounded or strongly convex ventrally; head moderately deep, DH/LH 0.59–0.64; OOL/WOT 1.25–1.45, FL/FW 2.00–2.15 (Figs. 13, 91) **66**
–. Mandible usually black to reddish brown (rarely yellow); posterior corners of head broadly rounded but distinct in dorsal view; genal angle absent, head evenly convex ventrally; if mandible yellow then DH/LH <0.57, OOL/WOT <1.25, and/or FL/FW >2.15 .... **67**

66 (65). Cell 2R1 open distally along wing margin (Fig. 13C); A3 somewhat elongate, obviously longer than wide; WH/LH ~0.90, FL/FW ~2.15 .... ***S. croceipes*** Fullaway, in part
–. Cell 2R1 fully closed (as in Fig. 12C); A3 slightly longer than wide but not obviously so without measuring (L/W 1.1–1.3); WH/LH <0.90, FL/FW <2.15 ... ***S. pololei* n. sp.**, in part

67 (65). Head as wide or wider than long, WH/LH 1.00–1.07 (Figs. 58A, 102A) **68**
–. Head never as wide as long, WH/LH 0.71–0.96 .... **69**

68 (67). Fore femur narrow, FL/FW ~2.15–2.30; clypeus recurved ventrally in profile; mandible more or less parallel-sided; metasoma with faint dorsal microreticulation over all terga (Fig. 58) .... ***S. mahui*** **n**. **sp**.
–. Fore femur very broad, FL/FW 1.65–1.80; clypeus evenly curved in profile, ventral apex about a right angle; mandible distinctly concave ventrally; metasoma mostly polished, microreticulate only laterally (Fig. 102) .... ***S. uluna*** **n**. **sp**.

69 (67). Frons punctation indistinct below, obscured by microsculpture which is dull between the eyes, distinctly smoother above; mandible twisted; head ventrally with moderately dense pubescence (Fig. 83) .... ***S. panoa*** **n**. **sp**., in part
–. Frons with distinct punctures; microsculpture of various forms but similar across the dorsal head; mandible not twisted; head usually with sparse setae ventrally **70**

70 (69). Mesosoma distinctly compressed, body flattened (DM/LM <0.33); head compressed, DH/LH 0.44–0.52, and usually nearly flat dorsally and ventrally in lateral view (Figs. 26–28, 65) **71**
–. Mesosoma not compressed; head usually deeper, DH/LH ≥0.53, and convex dorsally and ventrally **76**

71 (70). Vertex and gena setae elongate, conspicuous, nearly twice as long as frons setae; ocellar triangle front angle right to obtuse; lateral ocelli nearly touching vertex crest **72**
–. Vertex and gena setae similar to frons setae; ocellar triangle front angle at least slightly acute; lateral ocelli usually distinctly separate from vertex crest in dorsal view **73**

72 (71). Clypeus rounded triangular, distinctly elongate; frons closely punctate, 1–2 pit widths apart, appearing rather densely setose; mandible and legs may be yellow (Fig. 26) .... ***S. hiwi*** **n**. **sp**., in part
–. Clypeus short, semi-elliptical; frons sparsely punctate, 3 or more pit widths apart, appearing sparsely setose; mandible and femora dark brown to black (Fig. 28) .... ***S. hooneo*** **n**. **sp**., in part

73 (71). Clypeus in profile evenly curved or steep and nearly straight, apical angle right to acute (Figs. 39, 69) **74**
–. Clypeus in profile distinctly rounded and recurved, apical angle obtuse or obsolete (Figs. 27, 65) **75**

74 (73). Head broad and short posterior to eyes, WH/LH 0.80–0.90, EV/HE 0.75–0.95; mandible moderately narrow, distinctly concave ventrally; ocellar triangle weakly acute, OOL/WOT 1.50–1.75; lateral ocelli separated from vertex crest by less than their width (Fig. 39) .... ***S. kaapeha*** **n**. **sp**.
–. Head narrower and long posterior to eyes, WH/LH 0.67–0.77, EV/HE 1.05–1.25; mandible moderately broad, parallel-sided; ocellar triangle strongly acute, OOL/WOT 1.95–2.20; lateral ocelli separated from vertex crest by about their width (Fig. 69) .... ***S. molina*** **n**. **sp**., in part

75 (73). Head narrower, WH/LH 0.74–0.80, OOL/WOT >2.15; fore femur narrow, FL/FW >2.15 (Fig. 65) .... ***S. mealele*** **n**. **sp**.
–. Head broader, WH/LH 0.81–0.88, OOL/WOT 1.90–2.25; fore femur broader, FL/FW <2.15 (Fig. 27) .... ***S. holomelaena*** Fullaway

76 (70). Basal wing cells nearly glabrous, at most with only a few scattered hairs **77**
–. Basal wing cells distinctly setose, with at least one row of setae in cell 1Cu (cell R sometimes nearly glabrous) **80**

77 (76). Antenna short, A3 hardly longer than wide or wider than long; femora moderately broad, FL/FW 1.80–2.20, HFL/HFW <2.50; OOL/WOT >1.50 .... **78**
–. Antenna elongate, A3 distinctly longer than wide (L/W ~1.5 or more); femora very narrow, FL/FW >2.30, HFL/HFW >2.70; OOL/WOT <1.50 .... **79**

78 (77). Clypeus in profile evenly curved, apex not strongly recurved; head ventrally with moderately dense pubescence; mandible moderately narrow, weakly concave ventrally; frons broad, WF/HE >1.20; coxae and femora dark (Fig. 6) ... ***S. ala*** **n**. **sp**.

–. Clypeus in profile rounded and recurved at ventral apex; head ventrally with sparse setae; mandible moderately broad, distinctly concave ventrally; frons narrow, WF/HE <1.20; coxae and femora yellow (Fig. 40) .... ***S. kaawale*** **n**. **sp**.

79 (77). Clypeus in profile somewhat short, evenly curved above and slightly recurved ventrally; mandible black; head narrower and more compressed, WH/LH ~0.86, DH/LH ~0.55, OOL/WOT >1.25; small species (Fig. 60) .... ***S. maiki*** **n**. **sp**.

–. Clypeus in profile rather large and strongly arched; mandible yellow; head broad and deep, WH/LH 0.90–0.95, DH/LH 0.58–0.63, OOL/WOT <1.15; larger species (Fig. 77) .... ***S. nukupio*** **n**. **sp**.

80 (76). Clypeus in profile strongly rounded and recurved, ventral apex obtuse; head somewhat flattened in lateral view, weakly convex ventrally; vertex often slightly concave in dorsal view; head always moderately long posterior to eyes, EV/HE >0.85 (Figs. 34, 87, 93, 106) **81**

–. Clypeus in profile evenly curved or evenly sloping and nearly straight dorsally, apex right to acute, if rarely slightly recurved (*S. mawaena* n. sp.) then always matching the following characters; venter of head evenly to strongly convex in lateral view; vertex always straight, though sometimes slightly emarginate between ocelli; head usually short posterior to eyes, EV/HE <0.80 except in *S. neobrunnea* n. sp. **85**

81 (80). Head distinctly broad, WH/LH >0.87, and widened posterior of eyes; frons broad, WF/HE 1.35–1.45; mandible moderately broad; moderately large, LM ~1.0 mm (Figs. 31, 106) **82**

–. Head narrower, WH/LH <0.85, and parallel-sided posterior of eyes; frons narrow, WF/HE <1.25; other characters variable **83**

82 (81). Mandible almost parallel-sided, scarcely expanded towards apex; frons setae distinctly elongate, about twice as long as flagellum width; fore femur not so narrow, FL/FW 2.05–2.30 (Fig. 106) .... ***S. wahaula*** **n**. **sp**., in part

–. Mandible strongly expanded towards apex; frons setae short, only about as long as flagellum width; fore femur very narrow, FL/FW ~2.50 (Fig. 31) .... ***S. huna*** **n**. **sp**., in part

83 (81). Mandible moderately broad, strongly convex outwardly almost from base, ventral margin strongly concave; OOL/WOT >1.75; large species, LM >1.0 (Fig. 87) .... ***S. pikale*** **n**. **sp**.

–. Mandible moderately narrow, outwardly not or only weakly convex, ventral margin weakly concave; OOL/WOT <1.75; small species, LM <1.0 .... **84**

84 (83). Head moderately narrow, WH/LH 0.78–0.84; vertex straight in dorsal view; lateral ocelli nearly touching vertex crest (Fig. 34) .... ***S. iki*** **n**. **sp**., in part

–. Head very narrow, WH/LH ~0.73; vertex slightly but distinctly concave; lateral ocelli distinctly separate from vertex crest (Fig. 93) .... ***S. puakii*** **n**. **sp**., in part

85 (80). Head narrower, WH/LH 0.83–0.88, somewhat quadrate in dorsal view, parallel-sided for some distance posterior to eyes; frons microsculpture smooth to fine; apical half of mandible strongly convex outwardly (Figs. 68, 72) **86**

–. Head broader, WH/LH 0.88–0.96, more round in dorsal view, rounded to vertex shortly posterior to eyes; frons microsculpture almost always coriaceous to granular (rarely fine); apical half of mandible usually weakly convex to nearly flat outwardly (Figs. 23, 49, 64) **88**

86 (85). Legs entirely yellow; mandible yellow, distinctly concave ventrally; head more compressed, DH/LH 0.52–0.54; gena not or scarcely visible below anteroventral margin of eye in direct lateral view (Fig. 72) .... ***S. neobrunnea*** **n**. **sp**., in part

–. Coxae and femora dark brown to black; mandible reddish brown to black, parallel-sided to weakly concave ventrally; head deeper, DH/LH 0.55–0.58; gena distinctly visibly below anteroventral margin of eye in direct lateral view **87**

87 (86). Frons distinctly punctate; dorsum of head moderately strongly convex in lateral view; hind femur broad, HFL/HFW 2.00–2.25 (Fig. 68) .... ***S. minuta*** Fullaway

–. Frons appearing impunctate, setae arising from shallow obscure pits; dorsum of head weakly convex in lateral view; hind femur very narrow, HFL/HFW >2.90 (Fig. 63) .... ***S. mani*** **n**. **sp**.

88 (85). Metasoma with faint microsculpture medially, more distinct on apical tergites; A3 moderately longer than wide, L/W 1.3–1.5; vertex crest with a shallow emargination between lateral ocelli in direct dorsal view (Figs. 49A, 64A) **89**

–. Metasoma highly polished except near lateral margins of tergites; A3 variable, often longer, L/W up to 1.7; vertex crest straight, not emarginate between lateral ocelli (Figs. 23A, 95A) **90**

89 (88). Basal wing cells clearly sparsely setose, cell Cu1 with a distinct row of setae but cell R with relatively few and sometimes appearing nearly glabrous ..... ***S. koolau*** **n**. **sp**.

–. Basal wing cell setation intermediate, cell R with numerous irregular setae clearly in more than one row .... ***S. mawaena*** **n**. **sp**., in part

90 (88). Basal wing cells each with only one row of setae .... ***S. puuwaawaa*** Fullaway

–. Basal wing cells each with at least two rows of setae each ..... ***S. gruneri*** **n**. **sp**., in part

91 (63). Metasoma punctate and coriaceous, with conspicuous microsculpture (Fig. 70D); mandible narrow, head somewhat compressed (DH/LH <0.58); sixth sternum evenly covered with dense, very short, anteriorly directed setae, at most with a very narrow, indistinct median glabrous area **92**

–. Metasoma shining, almost always strongly polished dorsally except at lateral margins of terga, rarely with smooth microreticulation but not coriaceous or punctate; if metasoma somewhat reticulate then mandible moderately broad and/or head much deeper, DH/LH >0.60; sixth sternum with distinct median glabrous strip, often broad, setae always erect or posteriorly directed, often with mix of long and short setae **93**

92 (91). Head compressed and elongate in lateral view, DH/LH 0.49–0.52, EV/HE 0.85–0.96, weakly convex ventrally (Fig. 70); found in dry forest in the Mauna Kea–Mauna Loa–Hualālai saddle region .... ***S. monticola*** Blackburn & Cameron

–. Head compact and deeper in lateral view, DH/LH ~0.55, EV/HE 0.60–0.70, evenly convex ventrally (Fig. 74); found elsewhere in wetter and/or lower regions .... ***S. nigrans*** Fullaway

93 (91). Head very narrow and compressed, WH/LH 0.71–0.78, DH/LH 0.44–0.51; mesosoma flattened (DM/LM <0.33) and gracile; vertex and gena setae elongate and conspicuous (Figs. 26, 28) **94**

–. Head broader and usually deeper, if rarely as above then mesosoma distinctly robust, not flattened; vertex and gena setae variable **95**

94 (93). Clypeus rounded triangular, distinctly elongate; frons closely punctate, 1–2 pit widths apart, appearing rather densely setose; mandible and legs may be yellow (Fig. 26) .... ***S. hiwi*** **n**. **sp**., in part

–. Clypeus short, semi-elliptical; frons sparsely punctate, 3 or more pit widths apart, appearing sparsely setose; mandible and femora dark brown to black (Fig. 28) .... ***S. hooneo*** **n**. **sp**., in part

95 (93). Vertex and gena setae elongate, conspicuous, stronger than frons setae, directed forward; clypeus in profile strongly arched, usually with a thin, laminar carina; frons densely punctate at least between the eyes, punctures 1 pit width apart or less, often all over; head width variable but usually WH/LH <0.88 (Figs. 45, 56) **96**

–. Vertex and gena setae not particularly conspicuous, sometimes longer than frons setae but not stronger; clypeus in profile sometimes strongly arched but usually not with a thin, laminar carina, never in combination; frons never densely punctate all over, at most with close punctation between the eyes, becoming sparser above; if rarely with a thin, strongly arched clypeal carina and moderately strong vertex setae then head very broad (WH/LH ≥0.90) and frons not closely punctate **104**

96 (95). Head flattened, DH/LH 0.49–0.52, and moderately to very narrow, WH/LH 0.77–0.84; head weakly convex ventrally (Fig. 109) .... ***S. zimmermani*** **n. sp.**, in part

–. Head deeper, DH/LH 0.53–0.67, WH/LH variable but often >0.84; head evenly to strongly convex ventrally, or genal angle distinct **97**

97 (96). Ocellar triangle front angle strongly acute, OOL/WOT 1.45–1.70; occipital margin carinate; head ventrally with moderately dense pubescence **98**

–. Ocellar triangle front angle right to weakly obtuse, OOL/WOT <1.45 (usually <1.30); head ventrally usually with sparse pubescence; occipital margin sometimes forming a rounded ridge but not sharply carinate **99**

98 (97). Head very broad and deep, WH/LH 0.85–0.93, DH/LH 0.65–0.69, prominently triangular in lateral view (Fig. 53) .... ***S. laticeps*** Fullaway

–. Head narrower and not so deep, WH 0.75–0.82, DH/LH 0.55–0.61, genal angle distinct but head not strongly triangular (Fig. 56) .... ***S. longiceps*** Fullaway

99 (97). Metasoma dorsally with faint microreticulation on posterior terga, ventrally conspicuously microreticulate almost all over; antenna short, A3 L/W 1.00–1.33, usually <1.15; WH/LH 0.85–0.92, OOL/WOT 1.00–1.20, HFL/HFW 2.20–2.40 .... ***S. indecora*** Fullaway, in part

–. Metasoma usually dorsally polished, with microreticulation only on lateral margins of terga, ventrally with some microreticulation but also with extensive polished areas; antenna longer, A3 L/W >1.15, usually >1.30; other measurements variable but head and hind femur often narrower, OOL/WOT often >1.20, always ≥1.20 if metasoma microreticulate dorsally **100**

100 (99). Lateral ocelli narrowly but distinctly separate from vertex; FL/FW always >2.00, often >2.15 .... **101**

–. Lateral ocelli nearly touching vertex; FL/FW variable but often <2.00, 1.80–2.15 ...... **102**

101 (100). Coxae and femora dark brown to black, legs usually all dark; median carina of propodeum absent; mandible black .... ***S. ehrhorni*** Fullaway

–. Legs yellow except dorsal margins of femora brown; median carina of propodeum present; mandible usually reddish brown (sometimes black) ...... ***S. eucrena*** Fullaway

102 (100). Femora narrow, FL/FW 2.10–2.25, HFL/HFW 2.50–2.75 ...... ***S. kilauea*** Fullaway

–. Femora broader, FL/FW 1.85–2.00, HFL/HFW 2.15–2.50 .... **103**

103 (102). Clypeus nearly triangular, moderately narrow, somewhat elongate in profile, evenly curved apically; vertex slightly but distinctly concave in dorsal view (Fig. 90) .... ***S. pokii*** **n. sp.**

–. Clypeus broadly rounded triangular to semicircular, in profile not elongate, evenly curved to highly arched and blunt; vertex straight in dorsal view (Fig. 97) .... ***S. scoriacea*** Fullaway

104 (95). Mandible yellow to reddish brown; legs usually predominantly or entirely yellow **105**
–. Mandible black; coxae and femora always dark brown to black **112**

105 (104). Clypeus short, truncate or very broadly rounded apically, in profile short and steep or strongly rounded and recurved apically (Figs. 43, 79); lateral ocelli distinctly separate from vertex crest; head more or less parallel-sided posterior to eyes; mandible moderately broad, usually reddish brown **106**
–. Clypeus rounded triangular to semi-elliptical, apex rounded, in profile evenly curved or strongly arched (Figs. 13, 72); lateral ocelli nearly touching vertex crest; head rounded shortly posterior to eyes; mandible narrow to moderately narrow, yellow to testaceous **107**

106 (105). Clypeus short trapezoidal, apex truncate; vertex narrowly and shallowly but distinctly emarginate between lateral ocelli; head strongly convex above and below; frons coriaceous; head broad and deep, WH/LH 0.90–0.98, DH/LH 0.62–0.66 .... ***S. kepa* n. sp.**, in part
–. Clypeus semi-elliptical, apex broadly rounded; vertex straight; head weakly convex above, moderately convex below; frons strongly granular, very dull; head narrower and not so deep, WH/LH 0.81–0.89, DH/LH 0.54–0.58 .... ***S. oneone* n. sp.**

107 (105). Head compressed, DH/LH 0.52–0.54; mandible strongly convex outwardly, distinctly concave ventrally; hind femur narrow, HFL/HFW >2.55 (Fig. 72) .... ***S. neobrunnea* n. sp.**, in part
–. Head deeper, DH/LH >0.57; mandible at most weakly convex outwardly, weakly concave ventrally; hind femur broader, HFL/HFW <2.55 .... **108**

108 (107). Frons finely microreticulate, somewhat shining; cell R sparsely setose at base, densely setose apically; clypeus in profile evenly curved; posterior corners of head strongly rounded off **109**
–. Frons microsculpture dull, coriaceous to granular; cell R densely setose all over; clypeus in profile somewhat strongly arched; posterior corners of head variable, often broadly rounded but distinct **110**

109 (108). Cell 2R1 open distally along wing margin (Fig. 13C); A3 somewhat elongate, obviously longer than wide; WH/LH ~0.90, FL/FW ~2.15 ... ***S. croceipes*** Fullaway, in part
–. Cell 2R1 fully closed (as in Fig. 12C); A3 slightly longer than wide but not obviously so without measuring (L/W 1.1–1.3); WH/LH <0.90, FL/FW <2.15 .... ***S. pololei* n. sp.**, in part

110 (109). Frons weakly coriaceous, somewhat shining; dorsum of head slightly convex in lateral view; A3 trapezoidal, about as long as wide or scarcely longer, L/W 1.0–1.2 (Fig. 54) .... ***S. lepida*** Fullaway
–. Frons distinctly granular, dull; dorsum of head strongly convex in lateral view; A3 cylindrical, distinctly longer than wide, L/W 1.40–1.65 (Figs. 37, 76) **111**

111 (110). Posterior corners of head broadly rounded but distinct; occipital margin broadly rounded; clypeus in profile smooth dorsally, without crenulations; fore femur distinctly narrow, FL/FW 2.25–2.45 (Fig. 37) .... ***S. imparata*** Fullaway
–. Posterior corners of head strongly rounded off; occipital margin forming a distinct narrow ridge; clypeus in profile evenly curved in general but crenulate or scalloped along the margin of the carina; fore femur moderately broad, FL/FW ~2.00 (Fig. 76) .... ***S. nihoniho* n. sp.**

112 (104). Lateral ocelli nearly touching vertex; DH/LH rarely to 0.60 (*S. indecora*), usually <0.58; mandible usually narrow to moderately narrow (moderately broad in *S. kauensis*) ... **113**
–. Lateral ocelli distinctly separate from vertex, if ambiguous then DH/LH >0.60; mandible usually moderately broad (except in *S. compacta*) **120**

113 (112). Head very deep and broad, DH/LH >0.64, WH/LH >0.95; genal angle prominent, strongly rounded, head triangular in lateral view; postgenal depression distinct; mandible moderately broad, distinctly concave ventrally; fore femur broad, FL/FW 1.65–1.85 (Fig. 42) .... ***S. kauensis*** **n**. **sp**.

–. Head not so deep and broad, DH/LH <0.63, WH/LH <0.95; genal angle absent, head evenly convex ventrally; postgenal depression absent or very shallow; mandible narrow to moderately narrow, usually parallel-sided or only weakly concave ventrally; fore femur usually narrower (Fig. 82, 86) **114**

114 (113). Frons finely microreticulate, somewhat shining; fore femur broad, FL/FW 1.80–2.05; head moderately narrow and compressed, WH/LH 0.86–0.92, DH/LH 0.56–0.60 .... ***S. perkinsi*** Fullaway

–. Frons coriaceous to granular, or if somewhat shining then head narrower and/or more compressed; fore femur narrow, FL/FW 1.95–2.40 (except in *S. larifuga* which has the frons strongly dull) **115**

115 (114). Side of head with a line of distinct tesselate microsculpture extending from posteroventral margin of eye to vertex crest; frons distinctly dull and granular; mandible moderately narrow, slightly concave ventrally; femora predominantly dark brown to black, apical third yellow, tibiae yellow .... ***S. larifuga*** Evans

–. Side of head without line of distinctive microsculpture between eye and vertex; frons microsculpture coriaceous; legs variable, but femora usually all dark **116**

116 (115). Clypeus in profile strongly arched; vertex and gena setae nearly twice as long as frons setae; frons punctation dense between eyes; femora all dark; fore femur robust, FL/FW 1.95–2.08 .... ***S. indecora*** Fullaway, in part

–. Clypeus in profile evenly curved or slightly angulate, not strongly arched; vertex and gena setae not strongly differentiated from frons setae; frons punctation irregular, not denser between eyes; femora coloration variable, fore femur usually narrower, FL/FW 2.05–2.35 .... **117**

117 (116). A3 distinctly longer than wide; head deep, DH/LH >0.58; dorsal margin of clypeus in profile somewhat angulate; femora pale apically; mandible narrow, parallel-sided (Fig. 23) .... ***S. gruneri*** **n**. **sp**., in part

–. A3 as wide as long or wider; head more compressed, DH/LH 0.49–0.57; clypeus in profile slightly recurved ventrally; femora all dark; mandible variable **118**

118 (117). Head evenly convex ventrally; mandible distinctly concave ventrally (Fig. 82) .... ***S. pakua*** **n**. **sp**.

–. Head weakly convex ventrally; mandible parallel-sided or only weakly concave ventrally **119**

119 (118). Frons setae inconspicuous, shorter than to about as long as flagellum width; frons sparsely to moderately punctate, at least 2 pit widths apart; ocellar triangle acute (Fig. 34) .... ***S. iki*** **n**. **sp**., in part

–. Frons setae conspicuous, distinctly longer than flagellum width; frons densely punctate between eyes; ocellar triangle obtuse (Fig. 109) ..... ***S. zimmermani*** **n**. **sp**., in part

120 (112). Lateral ocelli separated from vertex by about twice an ocellus length; ocellar triangle front angle very strongly acute; head very long posterior to eyes, EV/HE >1.4, OOL/WOT >2.35; clypeus in profile nearly straight, very weakly curved; frons microsculpture fine, somewhat shining (Fig. 61) .... ***S. makaiki*** **n**. **sp**.

–. Lateral ocelli separated from vertex by less than an ocellus length; ocellar triangle front angle weakly acute to weakly obtuse; head shorter posterior to eyes, EV/HE <1.1, OOL/WOT <1.80; clypeus in profile distinctly curved; frons microsculpture usually coriaceous to granular, more or less dull **121**

121 (120). Head narrow, elongate and quadrate in dorsal view, parallel-sided posterior to eyes, WH/LH 0.72–0.84, OOL/WOT 1.65–1.90; apex of clypeus slightly recurved in profile (Figs. 44, 93) **122**

–. Head broader and more compact, round or square in dorsal view, often narrowing or rounded shortly posterior to eyes, WH/LH 0.85–1.02, OOL/WOT <1.60; apex of clypeus usually not recurved in profile (Figs. 12, 71, 80) **123**

122 (121). Basal wing cells clearly densely setose; A3 about as long as wide; head broader, WH/LH 0.78–0.83; vertex straight in dorsal view (Fig. 44) .... ***S. kikanu*** **n**. **sp**.

–. Basal wing cells with intermediate setation, only two rows and a few additional setae; A3 distinctly longer than wide; head narrow, WH/LH ~0.73, vertex slightly but distinctly concave in dorsal view (Fig. 93) .... ***S. puakii*** **n**. **sp**., in part

123 (121). Metasoma distinctly coriaceous all over; frons closely punctate all over, punctures about 1 pit width apart; head deep, DH/LH ~0.63; OOL/WOT ~1.28 (Fig. 80) .... ***S. opakapaka*** **n**. **sp**.

–. Metasoma shining dorsally, microsculpture usually distinct only at lateral margins of terga, at most with very faint reticulation medially; frons variable but often with punctures at least 2–3 pit widths apart, at least above the eyes; DH/LH and OOL/WOT variable but usually not with those ranges in combination **124**

124 (123). Mandible moderately broad, distinctly concave ventrally; head strongly convex ventrally, with moderately dense pubescence (Fig. 36) ... ***S. illingworthi*** Fullaway

–. Mandible parallel-sided to weakly concave ventrally, width variable; setation variable ... **125**

125 (124). Antenna elongate, extending to posterior margin of pronotum, flagellar segments conspicuously longer than wide, A3 L/W ≥1.30; femora narrower, FL/FW usually >2.20, HFL/HFW >2.45 .... **126**

–. Antenna short, reaching to middle of pronotum at most, flagellar segments wider than long to scarcely longer than wide, A3 L/W 0.90–1.20; femora broader, FL/FW <2.20, HFL/HFW <2.50 .... **129**

126 (125). Frons very dull, with granular microsculpture; vertex with a shallow, narrow emargination between ocelli; malar space short but distinct, about 1/4 as long as basal width of mandible; basal wing cell setation intermediate, setae somewhat irregular; metasoma with smooth but distinct microsculpture dorsally, ventrally entirely microreticulate (Fig. 64) .... ***S. mawaena*** **n**. **sp**., in part

–. Frons not strongly dull, microsculpture coriaceous to fine and somewhat shining; vertex straight, not emarginate between ocelli; malar space very short, less than 1/4 as long as basal width of mandible; basal wing cells clearly densely setose; metasoma usually mostly polished dorsally (with very faint microreticulation on posterior terga in *S. mahana* n. sp.), ventrally with polished areas **127**

127 (126). Head flatter, weakly convex below, DH/LH 0.55–0.58; vertex and gena setae only slightly longer than frons setae, not strongly differentiated; frons finely microreticulate, somewhat shining (Fig. 57) .... ***S. mahana*** **n**. **sp**.

–. Head deep, strongly convex below, DH/LH 0.60–0.64; vertex and gena setae elongate, almost twice as long as frons setae; frons coriaceous, somewhat dull (Figs. 12, 55) **128**

128 (127). Head narrower, WH/LH ~0.90; propodeum very coarsely striate dorsally, median carina faintly but distinctly present; hind femur very narrow, HFW/HFL ~3.0; antenna very long, A3 L/W ~1.80 (Fig. 12) .... ***S. compacta*** Fullaway

–. Head broad, WH/LH 0.94–0.96; propodeum weakly striate, lacking median carina; hind femur moderately broad, HFL/HFW ~2.4–2.6; antenna moderately elongate, A3 L/W 1.35–1.50 (Fig. 55) .... ***S. levigata*** Fullaway

129 (125). Vertex and gena setae short, similar to those of frons; frons very dull, with granular microsculpture, punctures fine and close, 1–2 pit widths apart; mandible moderately broad (Figs. 20, 71) **130**

–. Vertex and gena setae elongate, about twice as long as those of frons, though sometimes thin and inconspicuous; frons coriaceous but not extremely dull, punctation sparser and irregular; mandible variable but often moderately narrow (Figs. 73, 99) ... **131**

130 (129). Head deeper, DH/LH ≥0.59; head dorsally distinctly convex in lateral view, more or less evenly curved from the ocelli to the clypeus; ocellar triangle front angle right to acute; mandible narrowed slightly beyond base but not with a distinct concavity (Fig. 20) .... ***S. fuscipennis*** Fullaway

–. Head not as deep, DH/LH 0.54–0.58; head dorsally only slightly convex in lateral view, somewhat flattened between ocelli and eye; ocellar triangle front angle weakly obtuse, wider, OOL/WOT 1.25–1.45; basal wing cell setation intermediate, each cell with two rows of setae plus a few additional or a short row; mandible distinctly but briefly concave just beyond base, remainder parallel-sided (Fig. 71) .... ***S. nemorensis*** Fullaway

131 (129). Posterior corners of head rounded but corners distinct, posterior head appearing distinctly quadrate in dorsal view; head and frons broad, WH/LH ~0.93, WF/HE ~1.35; hind femur very broad, HFL/HFW 1.90–2.20 (Fig. 73) .... ***S. newelli*** Fullaway

–. Posterior corners of head strongly rounded, corners obsolete, posterior head appearing distinctly ovate in dorsal view; head and frons narrower, WH/LH ~0.85, WF/HE ~1.10; hind femur somewhat narrow, HFL/HFW 2.30–2.50 (Fig. 99) ..... ***S. sophorae*** **n**. **sp**.

Species Accounts

Sierola acaciae n. sp.

Figure 2, Map 2

Island. Hawai‘i.

Diagnosis. Immediately recognizable among Hawai‘i species by the falcate mandible, glabrous wing cells, and flat clypeus. Closest to the species of the *S. anthracina* complex on O‘ahu, distinguished by the narrow, black, distinctly concave mandible.

Description. **Female**. *Head*. Clypeal process rounded triangular, apex rounded; dorsally flat, not carinate, slightly convex only laterally; in profile evenly sloping, nearly straight. Mandible narrow, expanded at base and apex, ventral margin distinctly concave; strongly twisted, outwardly polished, smooth, shining; in ventral view evenly, moderately curved. Apex of mandible strongly oblique, falcate, lacking subapical teeth. Malar space 1/3 as long as width of base of mandible. Dorsal setae of head shorter than flagellar width. Frons with shallow, uneven punctures, 1–3 pit widths apart. Vertex and gena setae distinctly longer than frons setae but only about as thick, not particularly conspicuous. Frons microsculpture evident but smooth, shining. Vertex in dorsal view more or less straight; occipital margin not carinate but forming a pronounced ridge. Lateral ocelli nearly touching vertex crest. Ocellar triangle front angle right. Head more or less parallel-sided for some distance posterior to eyes. Dorsum of head in lateral view slightly convex, head deepest on line through posterior margin of eye. Venter of head posterior to mandible flat in lateral view, with relatively sparse setae. Genal angle broadly rounded. Gena ventral to eye flat. Postgenal depression deep, distinct, broad. Antenna extending to posterior margin of pronotum.

Mesosoma. Anterior margin of dorsal pronotal area in lateral view weakly angulate. Pronotal setae about as long as flagellar width or scarcely longer. Propodeal disc laterally coarsely striate; metapleural carinae complete. Fore femur strongly expanded, less than twice as long as wide, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Highly polished, without a trace of microsculpture. Sixth sternum evenly pilose, with dense short erect setae.

Color. Body entirely dark brown to black. Antenna dark brown dorsally, yellowish brown ventrally. Mandible black. Coxae and femora dark brown to black, all tibiae and tarsi yellow-brown.

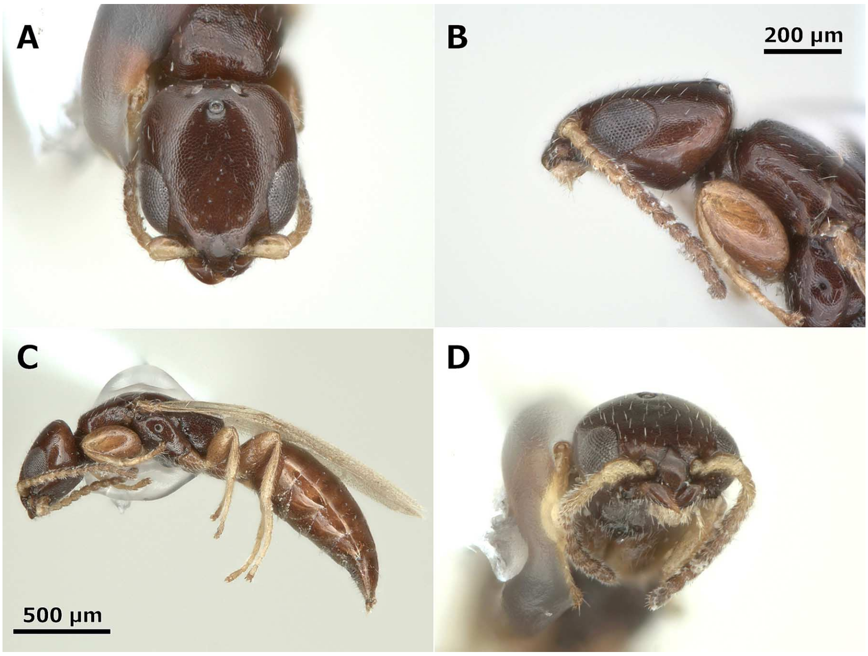


Figure 2. *Sierola acaciae*. A: head, dorsal. B: head, lateral. C: lateral habitus. D: head, frontal.

Wings. Membrane tinged with yellow. Basal cells of fore wing nearly glabrous, with only few scattered setae.

Measurements. LFW 1.68 mm; LM 0.85 mm; WH/LH 0.85 (0.82–0.90); DH/LH 0.56 (0.55–0.60); EV/HE 0.90 (0.90–1.00); EV/WF 0.74 (0.72–0.79); WF/HE 1.21 (1.21–1.30); WH/WF 1.70 (1.64–1.74); OOL/WOT 1.42 (1.38–1.54); DM/LM 0.41; FL/FW 1.91 (1.79–1.97); HFL/HFW 2.31 (2.19–2.33); A3 L/W 1.06 (1.00–1.17). N = 10.

Type Material. Holotype ♀. Hawai‘i: Mauna Loa Strip Road, 4,300 ft [1,300 m], D-Vac sample ex *Acacia koa*, 19 Jul 1971, J. Leeper, BPBMENT 0000018072. Paratypes: 1♀, Kona, 6,000 ft [1,830 m], 1 Aug 1892, R.C.L. Perkins, NHMUK 013380224. 1♀, Hualālai, 5 Aug 1892, R.C.L. Perkins, BPBM. 1♀, Kona, 4,000 ft [1,220 m], 279, 29 Jun 1892, R.C.L. Perkins, USNM. 2♀, Kīlauea, Aug 1895, R.C.L. Perkins, NHMUK 013380197, NHMUK 013380205. 1♀, Kīlauea, Jul 1896, R.C.L. Perkins, BPBM. 1♀, Kīlauea, 4,000 ft [1,220 m], Collection of W.M. Giffard, Aug 1896, A. Koebele, BPBM. 5♀, Kīlauea, Aug 1896, R.C.L. Perkins, BPBM. 2♀, Kīlauea, 656, Aug 1896, R.C.L. Perkins, USNM. 1♀, Kīpuka Puaulu, 28 Sep 1913, [no collector], BPBM. 1♀, So. Kona, 31 Aug 1924, W.M. Giffard, BPBM. 2♀ 4♂, Kīlauea, Kīpuka Puaulu, 26 Jun 1934, O.H. Swezey, BPBM. 1♂, same data, ex *Suttonia* [= *Myrsine*], 28 Jun 1934, BPBM. 4♀ 2♂, same data, ex *Xylosma*, BPBM. 1♂, same data, ex *Suttonia*, BPBM. 7♂, same data, ex *Myoporum*, 5 Jul 1934, BPBM. 6♀ 1♂, same data, ex *Acacia koa*, 14 Jul 1934, BPBM. 1♀, Humu‘ula, 7 Aug 1946, E.C. Zimmerman, BPBM. 1♀, Kīpuka Kī, *Myoporum*, 4 Jun 1947, O.H. Swezey, BPBM. 2♀, same data, *Pipturus*, 7 Jun 1947, BPBM. 1♀, Bird Park, Oct 1951, E. Dresner, BPBM. 1♂, Mauna Loa Forest Reserve, 6 Apr 1960, D.E. Hardy, BPBM. 1♀, Kīpuka Kī, [Hawaii Volcanoes] National Park, 29 Jan 1963, D.E. Hardy, BPBM. 4♀, ‘Ālo‘i Crater, nr. Chain of Craters Rd, 3,000 ft [900 m], 23 Jun 1966, J.W. Beardsley, BPBM. 11♀ 7♂, Kīpuka Puaulu, 1,140 m, 24 Jun 1966, J.W. Beardsley, BPBM. Mauna Loa Strip Road, 4,300 ft [1,300 m], D-Vac sample ex *Acacia koa*, J. Leeper, BPBM: 3♀ 2♂, 19 Jul 1971; 2♀, 2 Oct 1971; 4♀ 1♂, 7 Feb 1972; 6♀ 1♂, 30 Sep 1972; 9♀ 1♂, 9 Oct 1972; 2♀, 13 Oct 1973. Mauna Loa Strip Road, 4,300 ft [1,300 m], *Acacia koa*, J.W. Beardsley, BPBM: 2♂, 5 Jan 1973; 2♀ 3♂, 11 Feb 1973; 1♀, 13 Aug 1973. Mauna Loa Strip Road, 5,300 ft [1,620 m], D-Vac sample ex *Acacia koa*, J. Leeper, BPBM: 1♂, 14 Apr 1973; 2♂, 13 Oct 1973; 1♀ 1♂, 13 Dec 1973. 1♀, Mauna Loa Strip Road, 5 Jan 1972, BPBM [1♂ collected on the same day and labelled “Kohala Mts.” almost certainly belongs here]. 1♂, Mauna Loa Strip Road, IBP Study Site, 1,586 m, *Acacia koa*, Aug 1974, J. Leeper, BPBM.

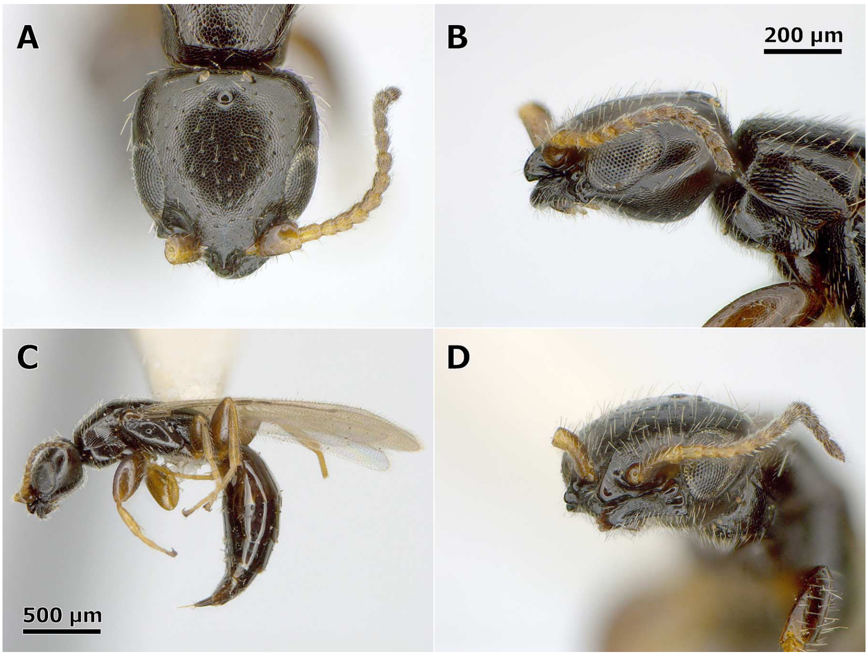


Figure 3. *Sierola ahulu*. A: head, dorsal. B: head, lateral. C: lateral habitus. D: head, frontal.

Etymology. Named for its frequent occurrence on koa (*Acacia koa*).

Distribution. Widespread in mesic to dry forest around the south and west portions of the island. This is the most abundant species at Kīlauea, occasionally occurring in large numbers.

Discussion. It is odd that this species was not described by Fullaway, as a number of Perkins' specimens are at BPBM. Surprisingly Giffard, who provided most of the specimens Fullaway used for his revision, does not seem to have taken it, and there is only one pre-1920 specimen from Swezey. One male specimen is labelled as being from Kohala, but it is from the same date as a female collected on Mauna Loa Strip Road, and is likely mislabeled.

***Sierola ahulu* n. sp.**

Figure 3, Map 2

Island. Hawaiʻi.

Diagnosis. A distinctive species, with the head ventrally somewhat densely setose and strongly convex but lacking a distinct genal angle, clypeus with a rounded carina dorsally and evenly curved in profile (somewhat arched compared to the curvature of the head), and basal wing cells sparsely setose, setae denser at apex of cell R. Most similar to *S. berryae* Ward of New Zealand, separated by the narrower mandible and having cell M1 narrow and elongate, not nearly an isosceles triangle.

Description. **Female**. *Head*. Clypeal process rounded triangular, apex rounded; dorsally with a rounded carina dorsally, effaced towards apex; in profile evenly curved from base to apex, apical angle slightly acute. Mandible moderately narrow, slightly narrowed medially from base, ventral margin weakly concave; not twisted, at most weakly convex outwardly, outwardly polished and shining near apex, remainder coriaceous (ventral margin with a conspicuous row of setae); in ventral view evenly, moderately curved. Apex of mandible vertical, with teeth distinctly stronger ventrally. Malar space very small. Dorsal setae of head about as long as flagellar width or scarcely longer. Frons with distinct, uneven punctures, 1–3 pit widths apart. Vertex and gena setae similar to and only slightly longer than setae of frons. Frons microsculpture finely microreticulate, surface weakly matte. Vertex in dorsal view more or less straight, corners somewhat squared; occipital margin broadly rounded. Lateral ocelli nearly touching vertex crest. Ocellar triangle front angle weakly acute to right. Head more or less parallel-sided for some distance posterior to eyes. Dorsum of head in lateral view strongly convex, head deepest on line through posterior margin of eye. Venter of head posterior to mandible convex in lateral view, with moderately dense pubescence. Head strongly convex ventrally, genal angle absent. Postgenal depression very shallow, nearly absent. Antenna extending to pronotum.

Mesosoma. Anterior margin of dorsal pronotal area in lateral view evenly rounded. Pronotal setae about as long as flagellar width or scarcely longer. Propodeal disc laterally coarsely striate; metapleural carinae complete. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with faint microsculpture laterally. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Body entirely dark brown to black. Antenna entirely dark brown except ventral side of basal segments yellowish. Mandible black. Coxae and femora dark brown to black, fore tibia and tarsus and all trochanters yellow, mid and hind tibiae and tarsi brownish.

Wings. Membrane hyaline. Basal cells of fore wing sparsely setose, cell R somewhat densely setose apically.

Measurements. LFW 1.92 mm; LM 0.96 mm; WH/LH 0.89 (0.89–0.93); DH/LH 0.61 (0.61–0.63); EV/HE 0.75 (0.61–0.79); EV/WF 0.56 (0.49–0.59); WF/HE 1.35 (1.23–1.35); WH/WF 1.62 (1.61–1.64); OOL/WOT 1.34 (1.15–1.41); DM/LM 0.37; FL/FW 2.06 (1.93–2.10); HFL/HFW 2.25 (2.10–2.28); A3 L/W 0.90 (0.80–1.00); 2R1 L/W 3.22. N = 6.

Type Material. Holotype ♀. Hawai‘i: Pōhakuloa, 1,800 m, 2 May 1966, J.W. Beardsley, BPBMENT 0000018073. Paratypes: 2♀, Humu‘ula, *Myoporum*, 31 Jul 1935, R.L. Usinger, BPBM. 1♀, Humu‘ula, *Myoporum*, 31 Jul 1936, E.H. Bryan, BPBM. 1♀, Pōhakuloa, ex *Chenopodium*, 1 Aug 1946, W.C. Look, BPBM. 1♀, near Humu‘ula, *Myoporum*, 3 Aug 1946, E.C. Zimmerman, BPBM. 1♀, same data, *Sophora*, BPBM. 7♀, same data, 7 Aug 1946, BPBM. 3♀, Pōhakuloa, 1,800 m, 2 May 1966, J.W. Beardsley, BPBM. 1♀, Ahumoa crater, 7,000 ft [2,130 m], 18 May 1966, J.W. Beardsley, BPBM. 2♀, Pōhakuloa, 1,800 m, 21 Jun 1966, J.W. Beardsley, BPBM. 3♀, Pōhakuloa, 1,800 m, 25 Jun 1966, J.W. Beardsley, BPBM. 1♀, Kohala Mts., 29 Jun 1966, C.M. Yoshimoto, BPBM. 1♀, Kohala Forest Reserve, 1,158 m, fogging *Metros. polymorpha*, 9–1, GRU 0702–004, 14 Oct 1997, D.S. Gruner & D.A. Polhemus, BPBM.

Etymology. From the Hawaiian *ā*, jaw, + *hulu*, hair, referring to the conspicuous setae on the mandible.

Distribution. Primarily found in the Pōhakuloa–Humu‘ula saddle region between Mauna Kea and Mauna Loa, with two collections from Kohala.

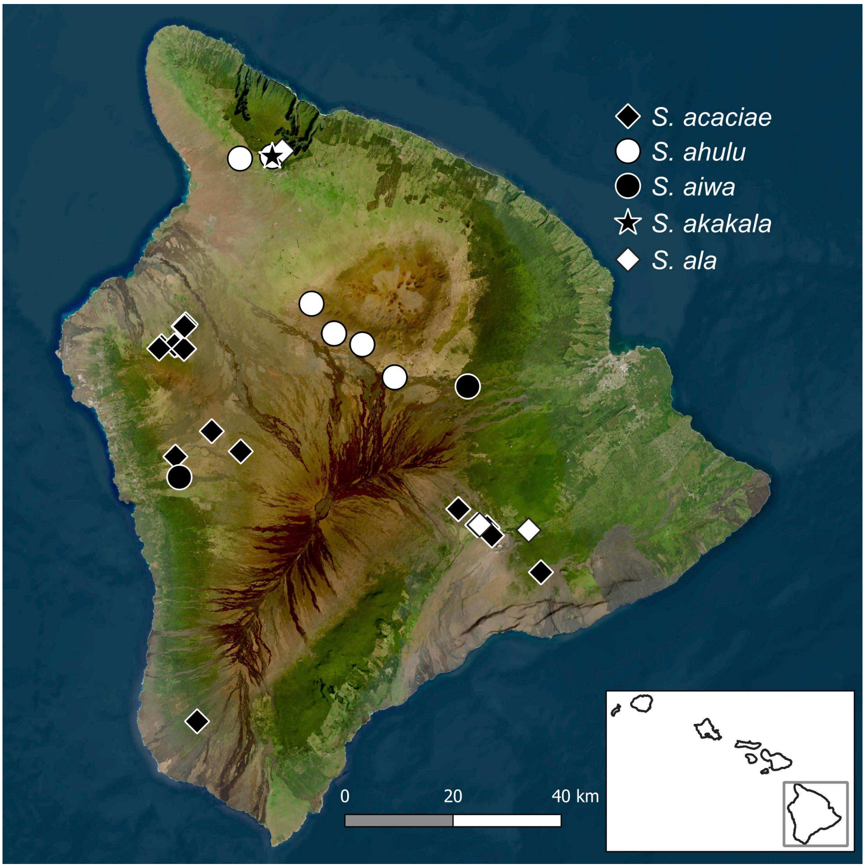
Discussion. The two specimens from Kohala differ in having the head slightly shorter behind the eyes and broadest across the eyes rather than behind, but are otherwise identical.

***Sierola aiwa* n. sp.**

Figure 4, Map 2

Island. Hawai‘i.

Diagnosis. Belonging to the group of species with the clypeus enlarged and weakly carinate or angulate dorsally. Separated from *S. winiwini* n. sp. and *S. sima* Fullaway by the rounded-quadrate clypeus which is rounded to weakly truncate apically and evenly curved in profile, black moderately broad mandible, head long behind the eyes, lateral ocelli separated from vertex crest by about their diameter, and sixth metasomal sternum glabrous medially.



Map 2. Collection localities of *Sierola acaciae*, *S. ahulu*, *S. aiwa*, *S. akakala*, and *S. ala*.

Description. **Female**. *Head*. Clypeal process broad, elongate, semicircular at the apex, apex broadly rounded; dorsally weakly carinate; in profile evenly curved from base to apex, apical angle slightly acute. Mandible broad, ventral margin slightly concave; strongly twisted, outwardly polished and shining distal of bend, coriaceous and dull basally; in ventral view obtusely elbowed. Apex of mandible slightly oblique, with teeth distinctly stronger ventrally. Malar space very small. Dorsal setae of head distinctly longer than flagellar width. Frons with shallow, uneven punctures, 1–3 pit widths apart. Vertex and gena setae similar to and only slightly longer than setae of frons. Frons microsculpture coriaceous, matte but without strong surface texture. Vertex in dorsal view very slightly concave; occipital margin broadly rounded. Lateral ocelli separated from vertex crest by about their own length. Ocellar triangle front angle weakly acute. Head more or less parallel-sided for some distance posterior to eyes. Dorsum of head in lateral view slightly convex, head deepest on line through posterior margin of eye. Venter of head posterior to mandible convex in lateral view, with relatively sparse setae. Head evenly convex ventrally, genal angle absent. Postgenal depression very shallow, nearly absent. Antenna extending to mesonotum.

Mesosoma. Anterior margin of dorsal pronotal area in lateral view evenly rounded. Pronotal setae longer than flagellar width. Propodeal disc laterally coarsely striate; metapleural carinae present posteriorly, fading anteriorly. Fore femur only moderately expanded, more than twice as long as wide, strongly laterally compressed, slightly arcuate in dorsal view.

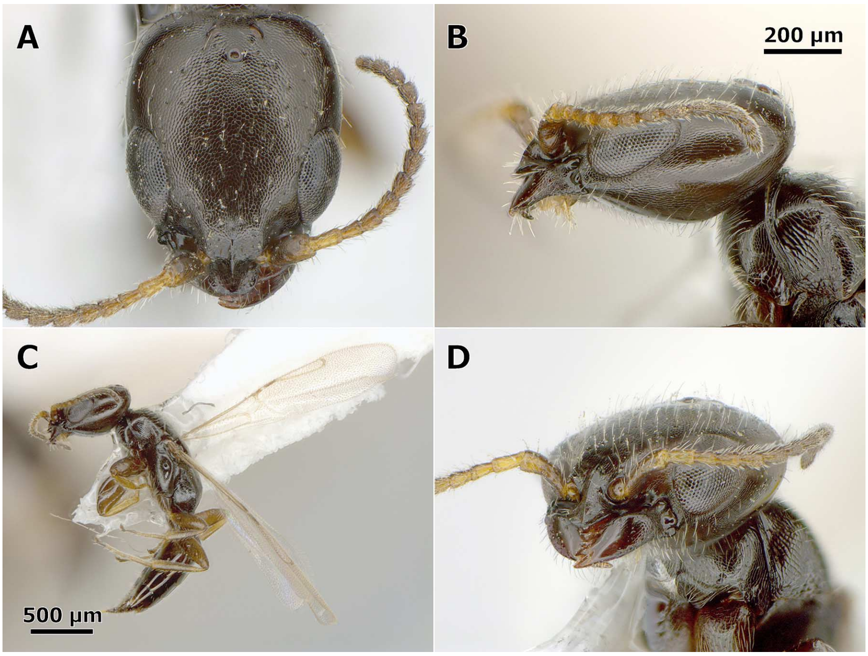


Figure 4. *Sierola aiwa*. A: head, dorsal. B: head, lateral. C: lateral habitus. D: head, frontal.

Metasoma. Highly polished, without a trace of microsculpture. Sixth sternum glabrous medially, laterally with dense pilose setae.

Color. Body entirely dark brown to black. Antenna entirely dark brown except ventral side of basal segments yellowish. Mandible black. Coxae, trochanters, and femora dark brown, fore tibia and tarsi yellow, mid and hind tibiae brown with yellow bands at bases and apices.

Wings. Membrane hyaline. Basal cells of fore wing sparsely setose, with one or two rows of setae in each cell.

Measurements. LFW 1.67 mm; LM 0.84 mm; WH/LH 0.76 (0.75–0.76); DH/LH 0.50 (0.48–0.50); EV/HE 1.14 (1.05–1.18); EV/WF 0.89 (0.87–0.93); WF/HE 1.28 (1.21–1.28); WH/WF 1.70 (1.67–1.72); OOL/WOT 1.87 (1.84–1.93); DM/LM 0.38; FL/FW 2.28 (2.27–2.43); HFL/HFW 2.90 (2.81–2.99); A3 L/W 1.60 (1.48–1.60); 2R1 L/W 2.8. N = 4.

Type Material. Holotype ♀. Hawai‘i: Saddle Road, Kīpuka #9, 5,100 ft [1,550 m], ex *Hyposmocoma* sp., 9 Jun 1991, W.D. Perreira, BPBMENT 0000018074. Paratypes: 2♀, same data as holotype. 1♀, Pu‘u Hualālai, 900–1,200 m, 27–28 Jun 1966, J.W. Beardsley, BPBM.

Etymology. From the Hawaiian ‘*a iwa*, nine, referring to the type locality, dubbed “Kīpuka #9” by Hawaiian *Drosophila* researchers.

Distribution. Rare, known only from the type series and one specimen from Kona.

Ecology. The type series was reared from a caterpillar of *Hyposmocoma* (Cosmopterigidae), but no other details are given that might enable determining the species.

Discussion. The type series consists of three point-mounted specimens on one pin; the topmost one is the holotype.

***Sierola akakala* n. sp.**

Figure 5, Map 2

Island. Hawai‘i.

Diagnosis. Easily recognized by the combination of convex clypeus (lacking any trace of a carina), mandible with normal teeth (not falcate), basal wing cells nearly glabrous, and

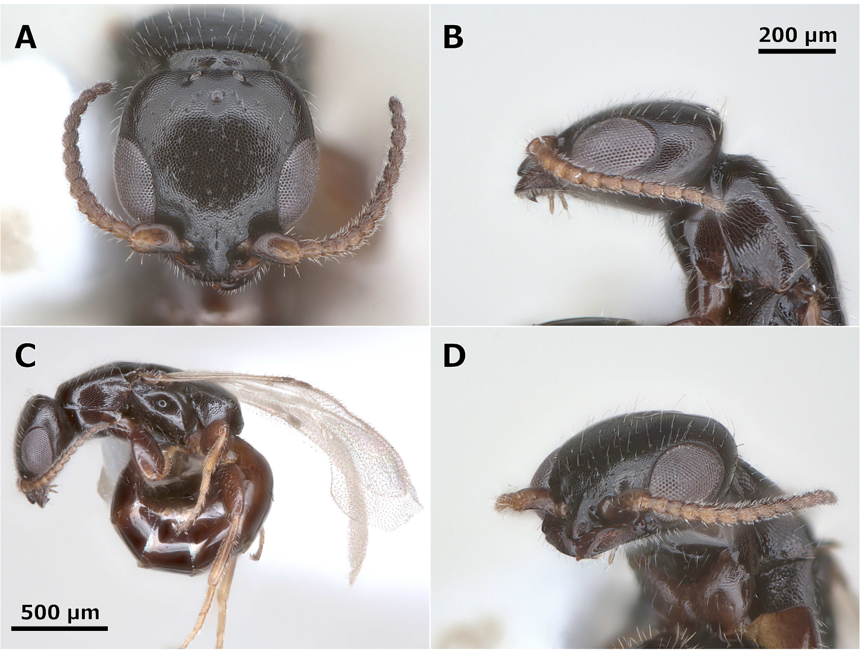


Figure 5. *Sierola akakala*. A: head, dorsal. B: head, lateral. C: lateral habitus. D: head, frontal.

head flattened. The last character separates it from *S. streblognatha* Fullaway, which has the head much deeper and strongly convex below. Very similar to *S. akahikina* Magnacca of O‘ahu, including the remarkably broad hind femur, but conspicuously sculpted all over.

Description. **Female**. *Head*. Clypeal process semicircular, apex rounded; dorsally rounded, convex, lacking a carina; in profile elongate, evenly curved, apex acute. Mandible narrow, more or less parallel-sided except at base; strongly twisted, outwardly polished and shining distal of bend, coriaceous and dull basally; in ventral view evenly, moderately curved. Apex of mandible vertical, with equally strong teeth. Malar space almost absent. Dorsal setae of head shorter than flagellar width. Frons moderately punctate, about 2–3 pit widths apart. Vertex and gena setae distinctly longer than frons setae but only about as thick, not particularly conspicuous. Frons microsculpture finely microreticulate, surface weakly matte to coriaceous, matte but without strong surface texture. Vertex in dorsal view very slightly concave; occipital margin not carinate but forming a pronounced ridge. Lateral ocelli nearly touching vertex crest. Ocellar triangle front angle weakly acute. Head narrowed posterior to eyes. Dorsum of head in lateral view slightly convex, head deepest on line through posterior margin of eye. Venter of head posterior to mandible flat in lateral view, with relatively sparse setae. Head evenly convex ventrally, genal angle absent. Postgenal depression very shallow, nearly absent. Antenna extending to posterior margin of pronotum.

Mesosoma. Anterior margin of dorsal pronotal area in lateral view weakly angulate, pronotal disc distinctly flattened. Pronotal setae about as long as flagellar width or scarcely longer. Propodeal disc laterally finely, weakly striate; metapleural carinae present posteriorly, fading anteriorly. Fore femur strongly expanded, less than twice as long as wide, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with very faint microreticulation over posterior terga. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

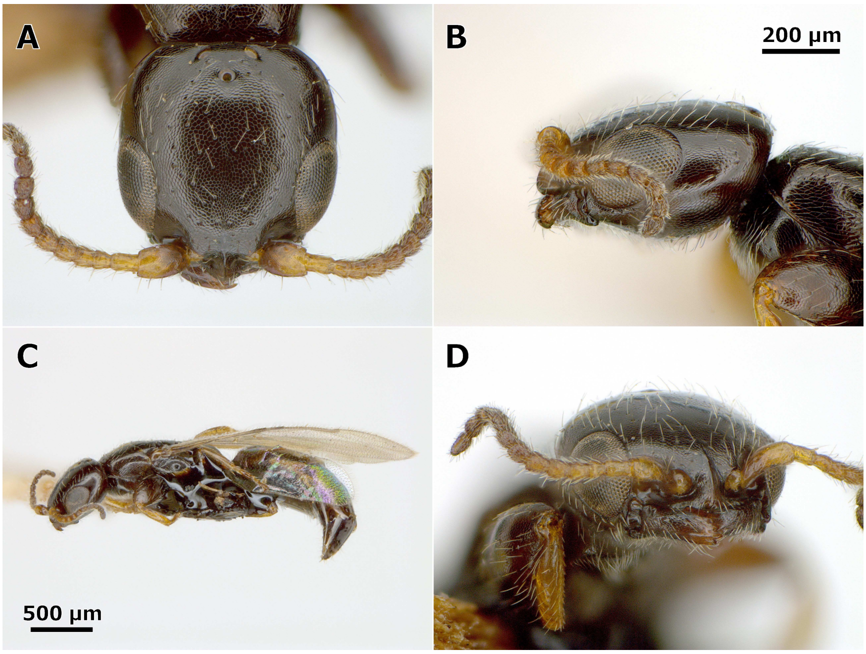


Figure 6. *Sierola ala*. A: head, dorsal. B: head, lateral. C: lateral habitus. D: head, frontal.

Color. Body entirely dark brown to black. Antenna brown on base of scape and apical flagellar segments, yellow medially. Mandible black to reddish brown. Coxae and femora brown, fore tibia and tarsus and all trochanters yellow, mid and hind tibiae and tarsi brownish.

Wings. Membrane hyaline. Basal cells of fore wing nearly glabrous, with only few scattered setae. Cell 1M weakly convex posteriorly, corner posteroapical.

Measurements. LFW 1.93 mm; LM 1.03 mm; WH/LH 0.95; DH/LH 0.52; EV/HE 0.67; EV/WF 0.54; WF/HE 1.23; WH/WF 1.70; OOL/WOT 1.45; DM/LM 0.38; FL/FW 1.82; HFL/HFW 1.82; A3 L/W 0.90; 2R1 L/W 3.

Type Material. Holotype ♀. Hawai‘i: Kohala Forest Reserve, 1,158 m, fogging *Metros. polymorpha*, 5–1, GRU 0589–014, 12 Oct 1997, D.S. Gruner & D.A. Polhemus, BPBMENT 0000018075.

Etymology. From the Hawaiian *aka*, shadow, + *kala*, rough, referring to the similarity to *S. akahikina* and sculpting of the body.

Distribution. Very rare, known only from the holotype, collected in wet forest in Kohala.

Sierola ala n. sp.

Figure 6, Map 2

Island. Hawai‘i.

Diagnosis. Among species with a sharp clypeal carina and the basal wing cells nearly glabrous, distinguished by the broad frons (WF/HE ≥1.20, OOL/WOT ≥1.55), broad fore femur (FL/FW ≤2.10), and moderately dense ventral setation of the head.

Description. **Female**. *Head*. Clypeal process semi-elliptical, apex rounded; dorsally with a sharp carina; in profile evenly curved from base to apex, apical angle slightly acute. Mandible moderately narrow, slightly narrowed medially from base, ventral margin weakly concave; apical half of mandible strongly convex outwardly, teeth arrayed on frontal and dorsal surfaces, outwardly polished and shining near apex, remainder coriaceous; in ventral view weakly curved. Apex of mandible slightly oblique, with teeth distinctly stronger ventrally. Malar space almost absent. Dorsal setae of head about as long as flagellar width or scarcely longer. Frons moderately punctate, about 2–3 pit widths apart. Vertex and gena setae similar to and only slightly longer than setae of frons. Frons microsculpture finely microreticulate, surface weakly matte. Vertex in dorsal view more or less straight; occipital margin narrowly rounded. Lateral ocelli distinctly separate from vertex crest by less than ocellus length. Ocellar triangle front angle weakly acute to right. Head more or less parallel-sided for some distance posterior to eyes. Dorsum of head in lateral view slightly convex, head deepest on line through posterior margin of eye. Venter of head posterior to mandible convex in lateral view, with moderately dense pubescence. Head weakly convex ventrally, genal angle absent. Postgenal depression very shallow, nearly absent. Antenna extending to anterior margin of pronotum.

Mesosoma. Anterior margin of dorsal pronotal area in lateral view evenly rounded. Pronotal setae about as long as flagellar width or scarcely longer. Propodeal disc laterally finely, weakly striate; metapleural carinae present posteriorly, fading anteriorly. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with very faint microreticulation over posterior terga. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Body entirely dark brown to black. Antenna brown on base of scape and apical flagellar segments, yellow medially. Mandible black. Coxae and femora dark brown to black, tibiae, tarsi, and trochanters brownish orange.

Wings. Membrane hyaline. Basal cells of fore wing nearly glabrous, with only few scattered setae. Cell 1M weakly convex posteriorly, corner posteroapical.

Measurements. LFW 2.15 mm; LM 1.10 mm; WH/LH 0.91; DH/LH 0.58; EV/HE 0.81; EV/WF 0.61; WF/HE 1.32; WH/WF 1.59; OOL/WOT 1.64; DM/LM 0.37; FL/FW 1.93; HFL/HFW 2.01; A3 L/W 1.00; 2R1 L/W 2.9.

Type Material. Holotype ♀. Hawai‘i: Upper Hāmākua Ditch Trail, ex dead ‘Ōhi‘a Lehua, 6 Oct 1929, O.H. Swezey, BPBMENT 0000018076. Paratypes: 1♀, same data as holotype, BPBM. 16♀, Upper Hāmākua Ditch Trail, ex *Semnoprepia* [= *Hyposmocoma*] larva in dead lehua, 6 Oct 1929, O.H. Swezey, BPBM. 1♀, Volcano Village, along Wright Rd, 3,860 ft [1,180 m], yellow sticky board trap, 20 Oct–3 Nov 1995, W.D. Perreira, BPBM. 1♀, Kīpuka Kī, yellow sticky card, site #18, card J, 3 May 2003, BPBM.

Etymology. From the Hawaiian *‘alā*, dense basalt rock used for making adzes and other tools, referring to the shiny appearance.

Distribution. Rare, known from a large series collected in Kohala in 1929 and two recent specimens from near Kīlauea.

Ecology. Reared from caterpillars of an undetermined species of *Hyposmocoma (Euperissus)* in dead wood. The host may be *H. petroptilota* Walsingham, which was originally separated in the genus *Semnoprepia* and is recorded from dead wood of *Metrosideros* on Hawai‘i.

Sierola angustata **Fullaway**, **1920**

Figure 7, Map 3

Sierola angustata Fullaway, 1920: 84.

Island. Hawai‘i.

Diagnosis. Easily recognized by the narrow, compressed head, flat clypeus, mandible not twisted, and basal wing cells densely setose. Closest to *S. levis* Fullaway of O‘ahu and *S. papio* n. sp.; the former has the basal wing cells nearly glabrous, clypeus convex, and mandible straight, while the latter has the basal wing cells intermediate, mandible strongly twisted, and head generally broader.

Description. **Female**. *Head*. Clypeal process semicircular, apex broadly rounded; dorsally flat, not carinate, slightly convex only laterally; in profile evenly sloping, nearly straight. Mandible very narrow, including at base; not twisted, at most weakly convex outwardly, outwardly shining but with distinct, fine microsculpture; in ventral view weakly

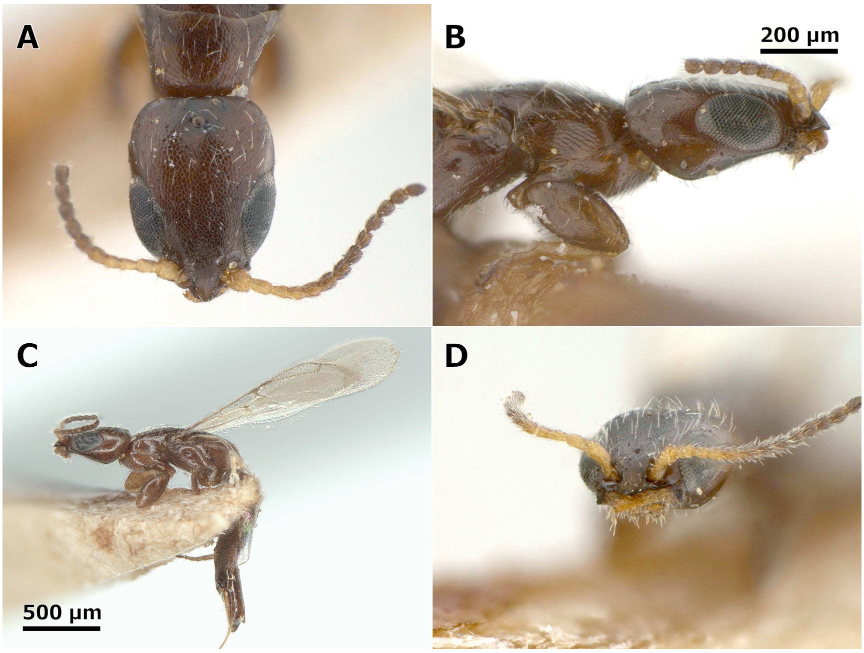


Figure 7. *Sierola angustata*. A: head, dorsal. B: head, lateral. C: lateral habitus. D: head, frontal.

curved. Apex of mandible slightly oblique, with equally strong teeth. Malar space very small. Dorsal setae of head distinctly longer than flagellar width. Frons appearing impunctate (setae arising from shallow pits that are only visible at low angles). Vertex and gena setae similar to and only slightly longer than setae of frons. Frons microsculpture finely microreticulate, surface weakly matte. Vertex in dorsal view more or less straight; occipital margin not carinate but forming a pronounced ridge. Lateral ocelli nearly touching vertex crest. Ocellar triangle front angle weakly acute to right. Head more or less parallel-sided for some distance posterior to eyes. Dorsum of head in lateral view slightly convex, head deepest on line through just posterior of eye. Venter of head posterior to mandible concave in lateral view, with relatively sparse setae. Genal angle broadly rounded. Postgenal depression shallow, rounded. Antenna extending to anterior margin of pronotum.

Mesosoma. Anterior margin of dorsal pronotal area in lateral view evenly rounded. Pronotal setae elongate, twice as long as flagellar width or more. Propodeal disc laterally finely, weakly striate; metapleural carinae present posteriorly, fading anteriorly. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Highly polished, without a trace of microsculpture. Sixth sternum broadly glabrous medially, with sparse setae laterally.

Color. Body entirely dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible yellow. Coxae and femora dark brown to black, tibiae dark brown, trochanters, tarsi, and bands at bases and apices of tibiae orange.

Wings. Membrane hyaline. Basal cells of fore wing densely and conspicuously setose.

Measurements. LFW 1.61 mm; LM 0.80 mm; WH/LH 0.71; DH/LH 0.50; EV/HE 0.89; EV/WF 1.00; WF/HE 0.89; WH/WF 1.88; OOL/WOT 1.70; DM/LM 0.37; FL/FW 2.17; HFL/HFW 2.53; A3 L/W 1.50.

Type Material. Holotype ♀. Hawai‘i: Kīlauea, Jan 1915, W.M. Giffard, BPBMENT 0000000025.

Distribution. Known only from the holotype, collected at Kīlauea in 1915.

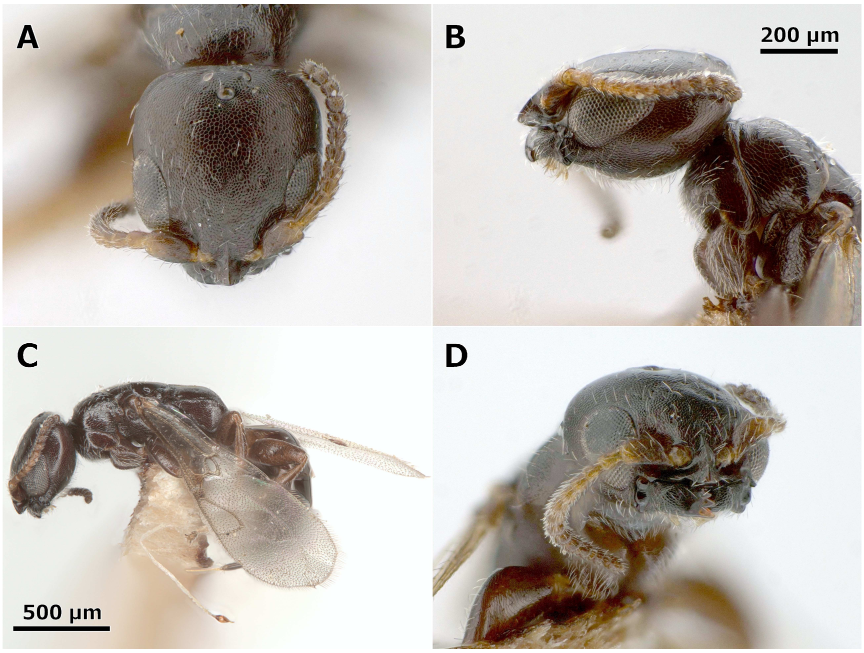


Figure 8. *Sierola atra*. A: head, dorsal. B: head, lateral. C: lateral habitus. D: head, frontal.

***Sierola atra* Fullaway, 1920**

Figure 8, Map 4

Sierola atra Fullaway, 1920: 154.
Sierola fuscipes Fullaway, 1920: 99, **n**. **syn**.

Island. Hawai‘i.

Diagnosis. Belonging to the species group with broad, more or less parallel-sided mandible and a sharp clypeal carina that is evenly sloping or weakly curved in profile. Differing from *S. blackburni* Fullaway and *S. uhapau* n. sp. by having the head relatively broad and deep but short behind the eye (WH/LH 0.83–0.91, DH/LH 0.57–0.61, OOL/WOT 1.55–1.90), frons sculpture coriaceous, and legs entirely brown. The latter two, along with the sparsely setose basal wing cells, also distinguish it from *S. striata* Fullaway of O‘ahu.

Description. **Female**. *Head*. Clypeal process rounded triangular or semicircular, apex rounded; dorsally with a sharp carina; in profile evenly sloping, nearly straight. Mandible broad, ventral margin slightly concave; not twisted, at most weakly convex outwardly, outwardly coriaceous, somewhat dull; in ventral view obtusely elbowed. Apex of mandible slightly oblique, with teeth distinctly stronger ventrally. Malar space almost absent. Dorsal setae of head about as long as flagellar width or scarcely longer. Frons with shallow, uneven punctures, 1–3 pit widths apart. Vertex and gena setae similar to and only slightly longer than setae of frons. Frons microsculpture coriaceous, matte but without strong surface texture. Vertex in dorsal view more or less straight; occipital margin broadly rounded. Lateral ocelli distinctly separate from vertex crest by less than ocellus length. Ocellar triangle front angle strongly to weakly acute. Head more or less parallel-sided for some distance posterior to eyes. Dorsum of head in lateral view slightly convex, head deepest on line through eye. Venter of head posterior to mandible convex in lateral view, with relatively sparse setae. Head evenly convex ventrally, genal angle absent. Postgenal depression very shallow, nearly absent. Antenna extending to anterior margin of pronotum.

Mesosoma. Anterior margin of dorsal pronotal area in lateral view evenly rounded. Pronotal setae short, inconspicuous. Propodeal disc laterally finely, weakly striate; metapleural carinae complete. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with faint microsculpture laterally, or with very faint microreticulation over posterior terga. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Body entirely dark brown to black. Antenna dark brown dorsally, yellowish brown ventrally. Mandible black. Legs all brown.

Wings. Membrane hyaline. Basal cells of fore wing sparsely setose, with one or two rows of setae in each cell.

Measurements. LFW 1.78 mm; LM 0.89 mm; WH/LH 0.87 (0.83–0.91); DH/LH 0.59 (0.57–0.61); EV/HE 0.89 (0.75–0.95); EV/WF 0.71 (0.65–0.80); WF/HE 1.26 (1.13–1.29); WH/WF 1.67 (1.64–1.74); OOL/WOT 1.80 (1.57–1.89); DM/LM 0.36; FL/FW 2.15 (2.00–2.26); HFL/HFW 2.33 (2.23–2.52); A3 L/W 1.00 (1.00–1.30). N = 17.

Type Material. Holotype ♀ of *Sierola atra*. Hawai‘i: 29 miles, ‘Ōla‘a, 3,800 ft [1,160 m], 10 Aug 1918, W.M. Giffard, BPBMENT 0000000163.

Holotype ♀ of *Sierola fuscipes*. Hawai‘i: Kīlauea, 4,000 ft [1,220 m], dry forest; numbered 4, 11 Jan 1917, W.M. Giffard & F. Muir, BPBMENT 0000000053.

Material examined: 2♀, Kīlauea, Aug 1896, R.C.L. Perkins, BPBM. 1♀, Kīlauea, 4,000 ft [1,220 m], dry forest; numbered 4, 11 Jan 1917, W.M. Giffard & F. Muir, HDOA (paratype of *S. fuscipes*). 11♀, Kīlauea, *Dodonaea*, 27 Jun 1917, O.H. Swezey, BPBM. 16♀, Kīlauea, Koa, 27 Jun 1917, O.H. Swezey, BPBM. 1♀, Upper Hāmākua Ditch Trail, *Rubus*, 3 Oct 1929, O.H. Swezey, BPBM. 1♀, Keanakolu, 5,250 ft [1,600 m], *Acacia koa*, 4 Oct 1931, O.H. Swezey & F.X. Williams, BPBM. 2♀, Kīlauea, 4 Aug 1946, E.C. Zimmerman, BPBM. 4♀, Kīlauea Forest Reserve IBP study site, 1,586 m, Malaise Trap #2, 15–22 Mar 1971, W.A. Steffan & W.C. Gagné, BPBM. 4♀, Kīlauea Forest Reserve IBP study site, 1,586 m, Malaise Trap #2, WAS #71–71, 16–23 Aug 1971, W.A. Steffan, BPBM. 1♀, Kīpuka Kī, yellow sticky card, site #23, card C, 17 May 2005, BPBM. 1♀, Upper Waiākea FR, kīpuka 9, 1,710 m, 19.6678°N 155.3693°W, canopy Malaise trap, collection K9-C-M, lot HI-1417, 20 Jul 2009, J. Riley & E. Parissenti, UMD. 1♀, Upper Waiākea FR, kīpuka 9, 1,709 m, 19.6678°N 155.3694°W, ‘ōhi‘a canopy branch clipping, collection 403, lot H.12.565, 10 May 2012, E.E. Wilson & D. Leopold, UMD.

Distribution. Known only from the windward side of the island; most specimens are from the vicinity of Kīlauea, with one each from Kohala and Hāmākua. Last collected in 1971.

Discussion. The type of *S. fuscipes* Fullaway is nearly identical to that of *S. atra* and well within the range of variation. The two paratypes of *S. fuscipes* collected separately from the holotype belong to distinctly different species. One is *S. pakua* n. sp.; the other appears to be *S. nemorensis* Fullaway but cannot be identified with certainty as it is missing the antennae and mandibles.

***Sierola aucta* Fullaway, 1920**

Figure 9, Map 3

Sierola aucta Fullaway, 1920: 144.

Island. Hawai‘i.

Diagnosis. A large species with the head also disproportionately large, long behind the eyes and frons broad. The clypeus is short and trapezoidal, truncate apically, lacks a sharp carina, and is evenly sloping in profile. Most similar to *S. granulosa* Magnacca and *S. hualala* Magnacca of O‘ahu, but differing significantly in the clypeus and mandible.

Description. **Female**. *Head*. Clypeal process trapezoidal, apex truncate; dorsally weakly carinate; in profile evenly sloping, nearly straight. Mandible moderately broad, distinctly narrowed medially and expanded at apex, ventral margin concave; apical half of mandible strongly convex outwardly, teeth arrayed on frontal and dorsal surfaces, outwardly coriaceous, somewhat dull; in ventral view evenly, moderately curved. Apex of mandible

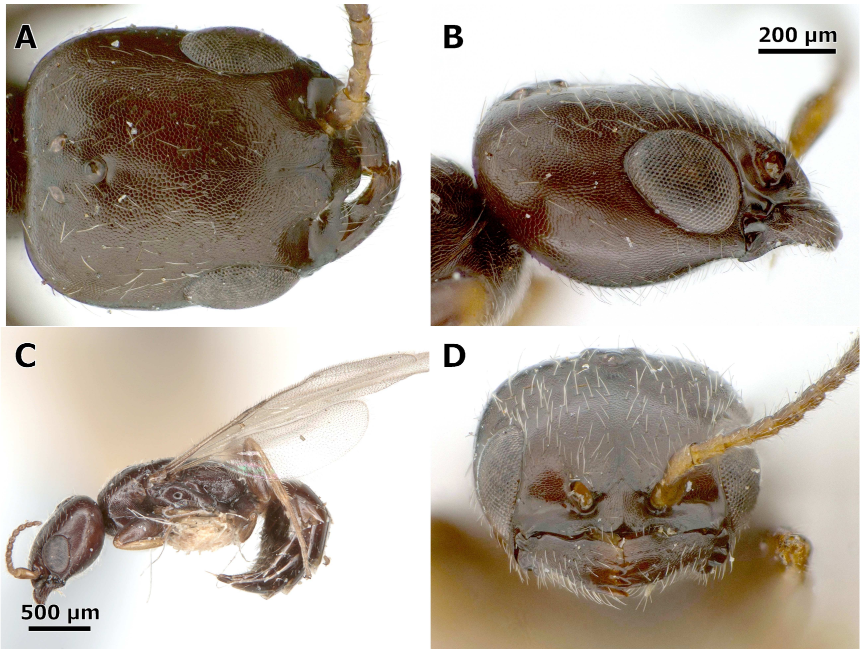


Figure 9. *Sierola aucta*. A: head, dorsal. B: head, lateral. C: lateral habitus. D: head, frontal.

vertical, with teeth distinctly stronger ventrally. Malar space very small. Dorsal setae of head about as long as flagellar width or scarcely longer. Frons with shallow, uneven punctures, 1–3 pit widths apart. Vertex and gena setae similar to and only slightly longer than setae of frons. Frons microsculpture finely microreticulate, surface weakly matte. Vertex in dorsal view very slightly concave; occipital margin broadly rounded. Lateral ocelli separated from vertex crest by greater than their length. Ocellar triangle front angle strongly acute. Head broadening posterior to eyes. Dorsum of head in lateral view nearly flat posterior to middle of eyes, head deepest on line well posterior of eye. Venter of head posterior to mandible convex in lateral view, with relatively sparse setae. Head evenly convex ventrally, genal angle absent. Postgenal depression very shallow, nearly absent. Antenna extending to anterior margin of pronotum.

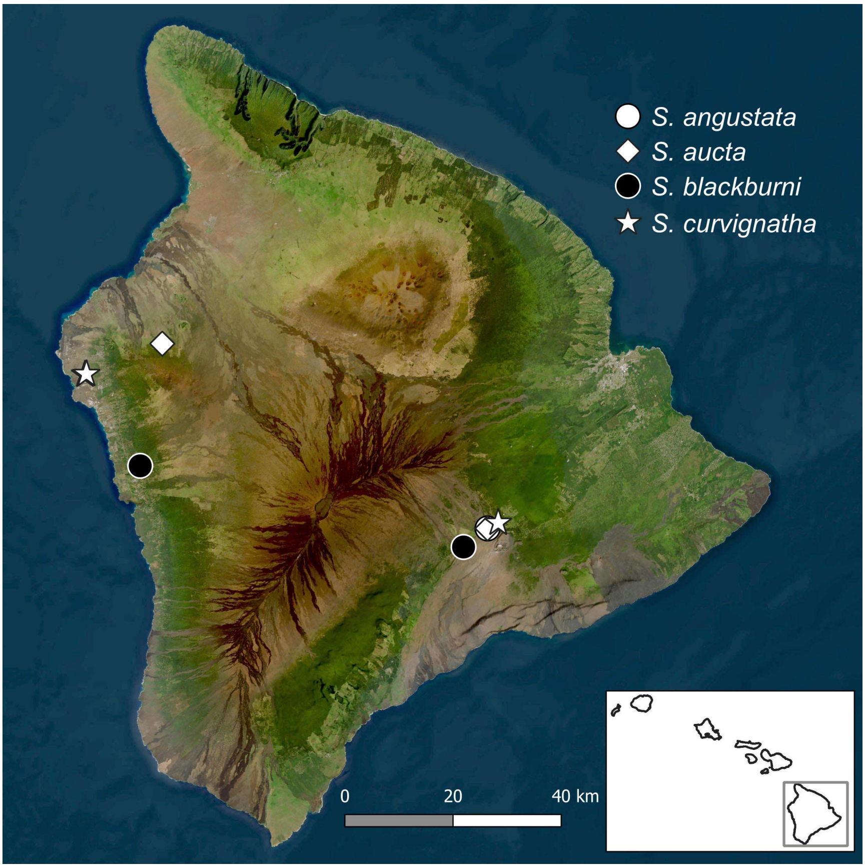
Mesosoma. Anterior margin of dorsal pronotal area in lateral view weakly angulate. Pronotal setae longer than flagellar width. Propodeal disc laterally finely, weakly striate; metapleural carinae present posteriorly, fading anteriorly. Fore femur only moderately expanded, more than twice as long as wide, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with faint microsculpture laterally. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Body entirely dark brown to black. Antenna dark brown dorsally, yellowish brown ventrally. Mandible black. Coxae, trochanters, and femora dark brown, tibiae and tarsi yellow.

Wings. Membrane tinged with yellow. Basal cells of fore wing sparsely setose, with one or two rows of setae in each cell.

Measurements. LFW 2.67 mm; LM 1.31 mm; WH/LH 0.84; DH/LH 0.60; EV/HE 1.26; EV/WF 0.85; WF/HE 1.48; WH/WF 1.48; OOL/WOT 2.00; DM/LM 0.40; FL/FW 2.53; HFL/HFW 3.00; A3 L/W 1.38.



Map 3. Collection localities of *Sierola angustata, S. aucta, S. blackburni*, and *S. curvignatha*.

Type Material. Holotype ♀. Hawai‘i: Pu‘u Wa‘awa‘a, 3,800 ft [1,160 m], numbered 11, 24 Aug 1917, W.M. Giffard, BPBMENT 0000000143.

Material examined: 1♀, Kīlauea, 19 Nov 1913, D.T. Fullaway, HDOA (paratype).

Distribution. Known only from the holotype and one paratype. Last collected in 1917.

Sierola blackburni Fullaway, 1920

Figure 10, Map 3

Sierola blackburni Fullaway, 1920: 150.

Island. Hawai‘i.

Diagnosis. Belonging to the species group with broad, more or less parallel-sided mandible and a sharp clypeal carina that is evenly sloping or weakly curved in profile. Differing from *S. atra* Fullaway by having the head narrower and longer behind the eye (WH/LH 0.81–0.83, DH/LH 0.53–0.57, and longer behind the eyes, OOL/WOT 1.95–2.25) and frons finely microreticulate. Closest to *S. uhapau* n. sp., separated by the broader femora (FL/FW 2.00–2.20, HFL/HFW 2.05–2.35) which are all dark, and the narrower frons (WF/HE ~1.15).

Description. **Female**. *Head*. Clypeal process semicircular, apex rounded; dorsally with a sharp carina; in profile evenly sloping, nearly straight. Mandible broad, not narrowed from base, ventral margin nearly straight; slightly twisted, outwardly coriaceous, somewhat

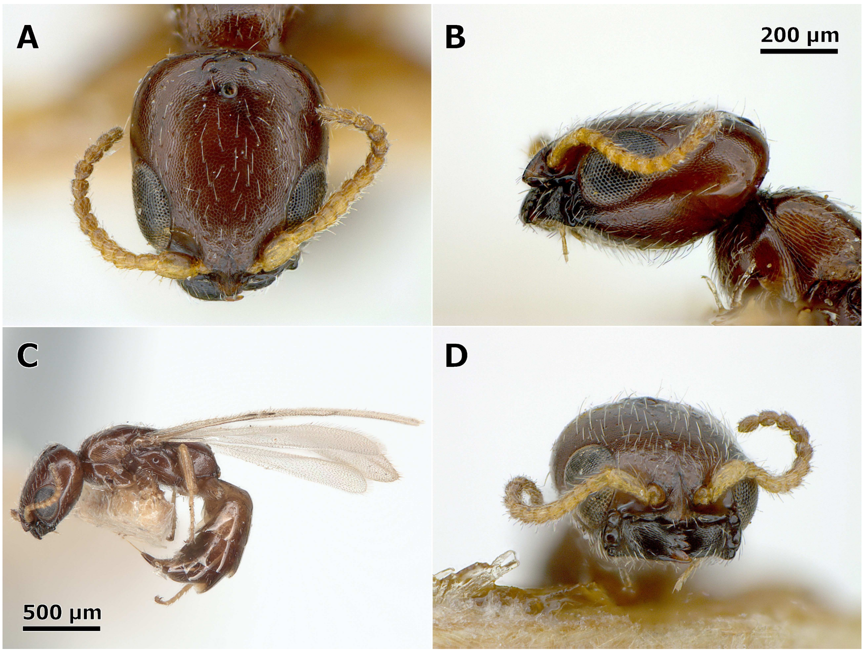


Figure 10. *Sierola blackburni*. A: head, dorsal. B: head, lateral. C: lateral habitus. D: head, frontal.

dull; in ventral view obtusely elbowed. Apex of mandible slightly oblique, with teeth distinctly stronger ventrally. Malar space very small. Dorsal setae of head about as long as flagellar width or scarcely longer. Frons with distinct, uneven punctures, 1–3 pit widths apart. Vertex and gena setae similar to and only slightly longer than setae of frons. Frons microsculpture finely microreticulate, surface weakly matte. Vertex in dorsal view more or less straight; occipital margin broadly rounded. Lateral ocelli separated from vertex crest by about their own length. Ocellar triangle front angle strongly acute. Head broadening posterior to eyes. Dorsum of head in lateral view slightly convex, head deepest on line through posterior margin of eye. Venter of head posterior to mandible convex in lateral view, with relatively sparse setae. Head evenly convex ventrally, genal angle absent. Postgenal depression very shallow, nearly absent. Antenna extending to anterior margin of pronotum.

Mesosoma. Pronotal setae longer than flagellar width. Propodeal disc laterally shining, with weak microsculpture; metapleural carinae present posteriorly, fading anteriorly. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Highly polished, without a trace of microsculpture.

Color. Body entirely dark brown to black. Antenna dark brown dorsally, yellowish brown ventrally. Mandible black. Coxae and femora dark brown to black, tibiae, tarsi, and trochanters yellow.

Wings. Membrane hyaline. Basal cells of fore wing densely and conspicuously setose.

Measurements. LFW 1.95 mm; LM 0.98 mm; WH/LH 0.81 (0.81–0.83); DH/LH 0.56 (0.53–0.56); EV/HE 1.06 (1.03–1.06); EV/WF 0.90; WF/HE 1.17 (1.14–1.17); WH/WF 1.71 (1.71–1.76); OOL/WOT 1.95 (1.95–2.11); DM/LM 0.37; FL/FW 2.00 (2.00–2.19); HFL/HFW 2.08 (2.08–2.33); A3 L/W 0.93. N = 2.

Type Material. Holotype ♀. Hawai‘i: Ka‘ū, 3,600 ft [1,100 m], on ‘a‘ā flows, 18 Jul 1918, W.M. Giffard, BPBMENT 0000000155.

Material examined: 1♀, Kona, 3,000 ft [900 m], Sep 1892, R.C.L. Perkins, NHMUK 013380226.

Distribution. Very rare, known only from two specimens. Last collected in 1918.

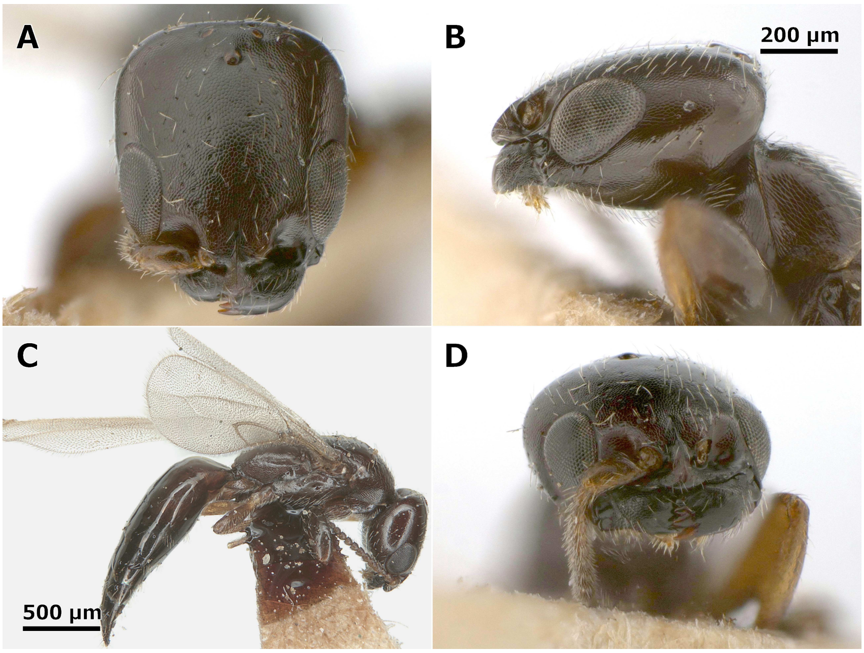


Figure 11. *Sierola carinata*. A: head, dorsal. B: head, lateral. C: lateral habitus. D: head, frontal.

Sierola carinata Fullaway, 1920

Figure 11, Map 4

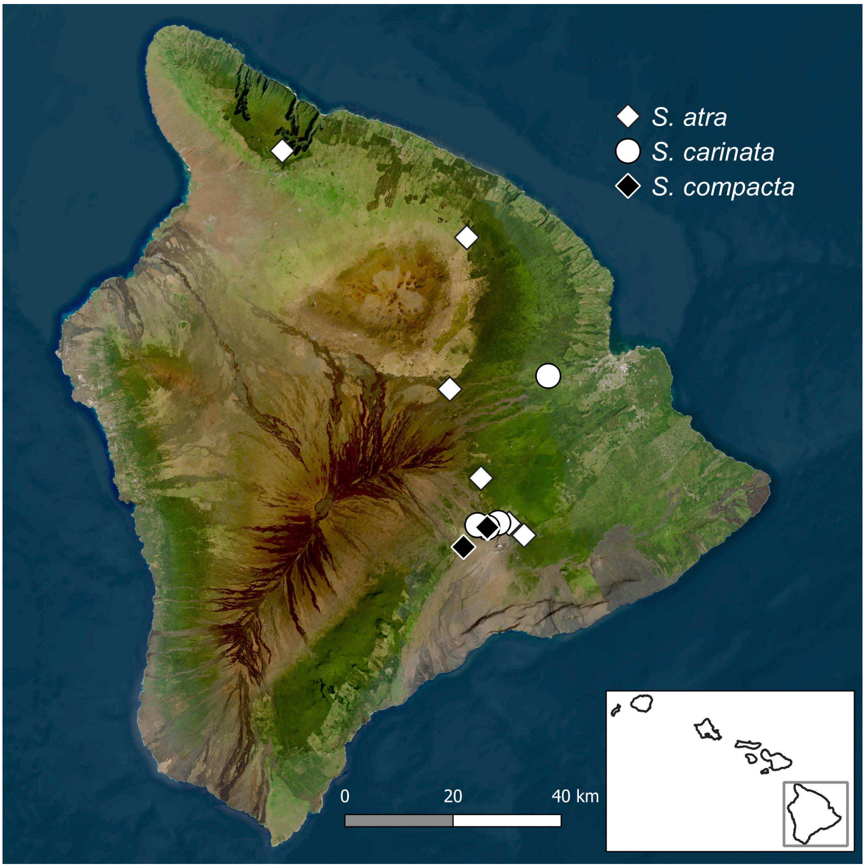
Sierola carinata Fullaway, 1920: 88.

Island. Hawai‘i.

Diagnosis. Belonging to the species group with broad, more or less parallel-sided mandible and a sharp clypeal carina. Close to *S. osborni* Fullaway in having the clypeus strongly rounded and recurved apically in profile; separated by having the head narrower and usually longer behind the eyes, and basal wing cells more densely setose.

Description. **Female**. *Head*. Clypeal process semicircular or semi-elliptical, apex broadly rounded; dorsally with a sharp carina; in profile weakly sloping dorsally but strongly rounded and recurved at apex. Mandible broad, not narrowed from base, ventral margin nearly straight; not twisted, at most weakly convex outwardly, outwardly coriaceous, somewhat dull; in ventral view obtusely elbowed. Apex of mandible slightly oblique, with teeth distinctly stronger ventrally. Malar space very small. Dorsal setae of head about as long as flagellar width or scarcely longer. Frons with distinct, uneven punctures, 1–3 pit widths apart. Vertex and gena setae similar to and only slightly longer than setae of frons. Frons microsculpture finely microreticulate, surface weakly matte. Vertex in dorsal view more or less straight; occipital margin broadly rounded. Lateral ocelli separated from vertex crest by about their own length. Ocellar triangle front angle weakly acute. Head broadening posterior to eyes. Dorsum of head in lateral view slightly convex, head deepest on line through posterior margin of eye. Venter of head posterior to mandible convex in lateral view, with moderately dense pubescence. Head evenly convex ventrally, genal angle absent. Postgenal depression shallow, rounded. Antenna extending to pronotum.

Mesosoma. Anterior margin of dorsal pronotal area in lateral view evenly rounded. Pronotal setae longer than flagellar width. Propodeal disc laterally shining, with weak microsculpture; metapleural carinae present posteriorly, fading anteriorly. Fore femur only moderately expanded, more than twice as long as wide, strongly laterally compressed, slightly arcuate in dorsal view.



Map 4. Collection localities of *Sierola atra, S. carinata*, and *S. compacta.*

Metasoma. Shining, with faint microsculpture laterally. Sixth sternum broadly glabrous medially, with sparse setae laterally.

Color. Body entirely dark brown to black. Antenna entirely dark brown to black. Mandible black. Fore coxa and femur black, legs otherwise brown, paler towards tarsi.

Wings. Membrane tinged with yellow. Basal cells of fore wing densely and conspicuously setose.

Measurements. LFW 2.44 mm; LM 1.16 mm; WH/LH 0.84 (0.84–0.87); DH/LH 0.59 (0.55–0.59); EV/HE 1.05 (0.90–1.14); EV/WF 0.80 (0.73–0.80); WF/HE 1.32 (1.23–1.42); WH/WF 1.68 (1.61–1.68); OOL/WOT 1.91 (1.70–1.96); DM/LM 0.37; FL/FW 2.33 (2.14–2.35); HFL/HFW 2.60 (2.36–2.60); A3 L/W 1.06 (1.06–1.12). N = 4.

Type Material. Holotype ♀. Hawai‘i: Kīlauea, 4,000 ft [1,220 m], taken at the lumber camp, 11 Jan 1917, W.M. Giffard, BPBMENT 0000000032.

Material examined: 1♀, Kīlauea, Aug 1896, R.C.L. Perkins, BPBM. 1♀, Kaumana, 29 Apr 1920, O.H. Swezey, BPBM. 1♀, Mauna Loa Strip Road, 4,300 ft [1,300 m], D-Vac sample ex *Acacia koa*, 2 Oct 1971, J. Leeper, BPBM.

Distribution. Very rare, known only from four specimens collected in wet to mesic forest around Kīlauea and to the east. Last collected in 1971.

Discussion. This may eventually prove to be synonymous with *S. osborni*, but at present only relatively few specimens of each are available. Given the subjective difference in

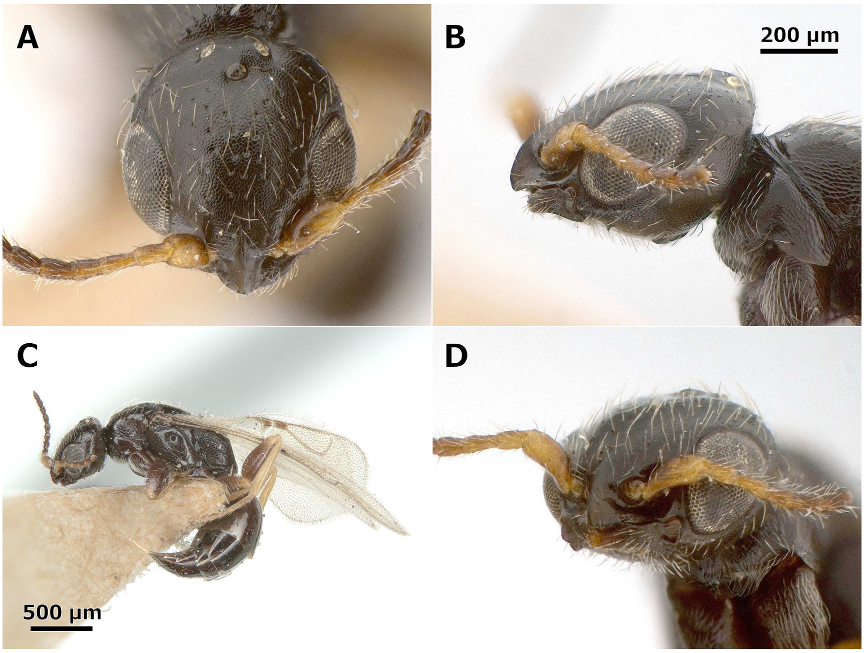


Figure 12. *Sierola compacta*. A: head, dorsal. B: head, lateral. C: lateral habitus. D: head, frontal.

appearance of the head and gap in width between specimens assigned to the two, it seems best to maintain them as separate for the time being. The Kaumana specimen has the legs paler and the head shorter behind the eyes than the type; the latter character is also shared with the Perkins specimen.

Sierola compacta Fullaway, 1920

Figure 12, Map 4

Sierola compacta Fullaway, 1920: 90.

Island. Hawaiʻi.

Diagnosis. Part of a large complex of species with a sharp, curved to arched clypeal carina, densely setose basal wing cells, lateral ocelli distinctly separate from the vertex crest, and head deep (DH/LH ≥0.59). Readily separated from related species by the distinctly narrow femora (especially the hind femur, HFL/HFW ~3.0), elongate A3, short OOL/WOT (~1.10–1.15), coarsely sculpted propodeum with a faint median carina, and narrow mandible.

Description. **Female**. *Head*. Clypeal process semicircular, apex rounded; dorsally with a sharp carina; in profile strongly arched, vertical or slightly recurved at apex, carina extending above antennal sockets, or evenly curved from base to apex, apical angle slightly acute. Mandible narrow, more or less parallel-sided except at base; not twisted, at most weakly convex outwardly, outwardly shining but with distinct, fine microsculpture; in ventral view evenly, moderately curved. Apex of mandible vertical, with equally strong teeth. Malar space very small. Dorsal setae of head distinctly longer than flagellar width. Frons with distinct, uneven punctures, 1–3 pit widths apart. Vertex and gena setae conspicuous, nearly twice as long as setae of frons and stronger, erect and directed anterior. Frons microsculpture coriaceous, matte but without strong surface texture. Vertex in dorsal view more or less straight, corners strongly rounded off; occipital margin narrowly rounded. Lateral ocelli distinctly separate from vertex crest by less than ocellus length. Ocellar triangle front angle right. Head rounded shortly posterior to eyes. Dorsum of head in lateral view strongly convex, head deepest on line through eye. Venter of head posterior to mandible convex in lateral view, with relatively sparse setae. Head evenly convex ventrally, genal angle absent. Postgenal depression very shallow, nearly absent. Antenna extending to posterior margin of pronotum.

Mesosoma. Anterior margin of dorsal pronotal area in lateral view evenly rounded. Pronotal setae elongate, twice as long as flagellar width or more. Propodeal disc laterally coarsely striate; median carina faintly present; metapleural carinae complete. Fore femur only moderately expanded, more than twice as long as wide, with both anterior and posterior surfaces convex, not strongly compressed, more or less straight in dorsal view.

Metasoma. Shining, with faint microsculpture laterally. Sixth sternum broadly glabrous medially, with sparse setae laterally.

Color. Body entirely dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible black, reddish at apex before teeth. Coxae and femora dark brown to black, tibiae, tarsi, and trochanters yellow.

Wings. Membrane tinged with yellow. Basal cells of fore wing densely and conspicuously setose.

Measurements. LFW 2.41 mm; LM 1.20 mm; WH/LH 0.90; DH/LH 0.63; EV/HE 0.66; EV/WF 0.58; WF/HE 1.13; WH/WF 1.73; OOL/WOT 1.14; DM/LM 0.45; FL/FW 2.22; HFL/HFW 3.00; A3 L/W 1.82.

Type Material. Holotype ♀. Hawai‘i: Ka‘ū, 3,600 ft [1,100 m], on ‘a‘ā flows, 18 Jul 1918, W.M. Giffard, BPBMENT 0000000037.

Material examined: 1♀, Kīlauea, Jul 1895, R.C.L. Perkins, NHMUK 013380195. 1♀, Kīlauea, numbered 13, 12 Jun 1908, W.M. Giffard, BPBM (paratype).

Distribution. Very rare, known from only three specimens taken in the Kīlauea–Ka‘ū area; last collected in 1918.

Discussion. The paratype has an upside-down holotype label for “Sierola mimica”, apparently a Fullaway manuscript name.

Sierola croceipes Fullaway, 1920

Figure 13, Map 18

Sierola croceipes Fullaway, 1920: 127.

Island. Hawai‘i.

Diagnosis. A relatively distinct species, with the posterior corners of the head strongly rounded in dorsal view, sharp clypeal carina, relatively deep head (DH/LH 0.59–0.63), and mandible yellow and narrow. Similar to *S. tenebriosa* of O‘ahu, differing in having the basal wing cells sparsely setose except at the apex of cell R, and frons finely microreticulate rather than dull and granular. Nearly identical to *S. pololei* n. sp., separated by the open cell 2R1 of the fore wing.

Description. **Female**. *Head*. Clypeal process semicircular, apex broadly rounded; dorsally with a sharp carina; in profile evenly curved from base to apex, apical angle slightly acute. Mandible narrow, slightly expanded at base and apex, ventral margin weakly concave; not twisted, at most weakly convex outwardly, outwardly coriaceous, somewhat dull; in ventral view evenly, moderately curved. Apex of mandible vertical, with equally strong teeth. Malar space almost absent. Dorsal setae of head distinctly longer than flagellar width. Frons with distinct, uneven punctures, 1–3 pit widths apart. Vertex and gena setae distinctly longer than frons setae but only about as thick, not particularly conspicuous. Frons microsculpture finely microreticulate, surface weakly matte. Vertex in dorsal view more or less straight, corners strongly rounded off; occipital margin narrowly rounded. Lateral ocelli nearly touching vertex crest. Ocellar triangle front angle right to weakly obtuse. Head rounded shortly posterior to eyes. Dorsum of head in lateral view slightly convex, head deepest on line through posterior margin of eye. Venter of head posterior to mandible flat in lateral view, with relatively sparse setae. Genal angle broadly rounded. Gena ventral to

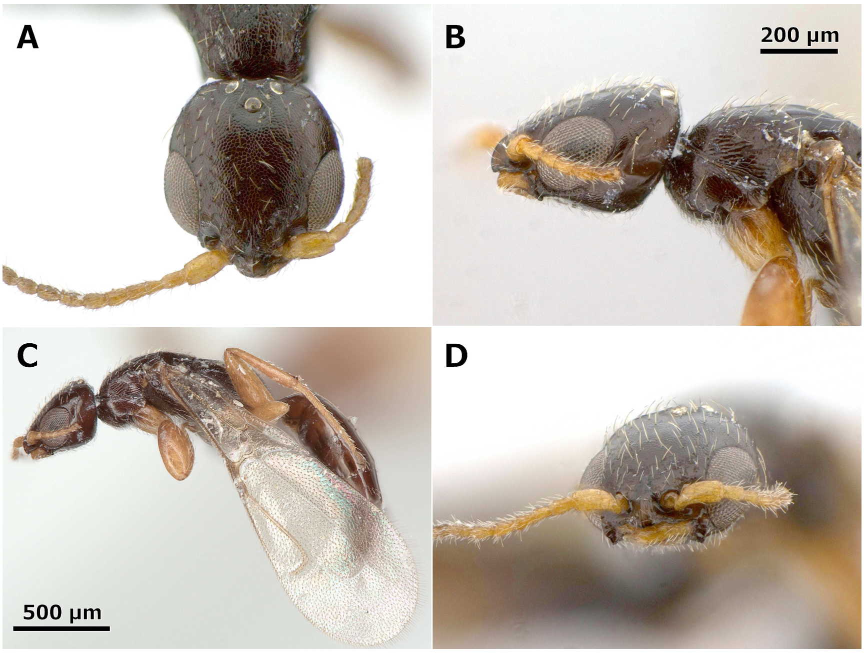


Figure 13. *Sierola croceipes*. A: head, dorsal. B: head, lateral. C: lateral habitus. D: head, frontal.

eye flat. Postgenal depression very shallow, nearly absent. Antenna extending to posterior margin of pronotum.

Mesosoma. Anterior margin of dorsal pronotal area in lateral view evenly rounded. Pronotal setae longer than flagellar width. Propodeal disc laterally finely, weakly striate; metapleural carinae complete. Fore femur only moderately expanded, more than twice as long as wide, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with faint microsculpture laterally. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Body entirely dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible yellow. Legs all yellow except base of fore coxa brown.

Wings. Membrane tinged with yellow. Basal cells of fore wing sparsely setose, cell R somewhat densely setose apically. Distal portion of vein Rs nearly straight but not quite meeting anterior wing margin, postmarginal vein indistinct.

Measurements. LFW 2.12 mm; LM 0.95 mm; WH/LH 0.90 (0.90–0.91); DH/LH 0.61 (0.61–0.63); EV/HE 0.72 (0.67–0.77); EV/WF 0.61 (0.59–0.69); WF/HE 1.19 (1.13–1.19); WH/WF 1.68 (1.68–1.71); OOL/WOT 1.24 (1.23–1.25); DM/LM 0.37; FL/FW 2.20 (2.14–2.20); HFL/HFW 2.30 (2.30–2.53); A3 L/W 1.30 (1.30–1.50). N = 3.

Type Material. Holotype ♀. Hawai‘i: 29 miles, Kīlauea, Jan 1915, W.M. Giffard, BPBMENT 0000000110.

Material examined: 1♀, Crater Road, Kīlauea, 3,800 ft [1,160 m], 28 Jun 1918, W.M. Giffard, BPBM. 1♀, Kaloko Drive, 3,500 ft [1,070 m], 19.7063°N 155.9398°W, sweeping, 28 Dec 2009, K.N. Magnacca, KNMC. 1♀ 1♂, Pu‘u Wa‘awa‘a WS, 4,400 ft [1,340 m], 19.7348°N 155.8795°W, beating *Acacia koa*, 15 Aug 2012, K.N. Magnacca, KNMC. 1♀, Kukuiopa‘e upper, 1,400 m, 19.3047°N 155.8196°W, Townes Malaise trap, H22102501–16, 11 Aug–25 Oct 2022, K.N. Magnacca, BPBM.

Distribution. Apparently rare, known only from the holotype and one other specimen from Kīlauea and a few recent ones from Kona, but see notes under *S. pololei* n. sp.

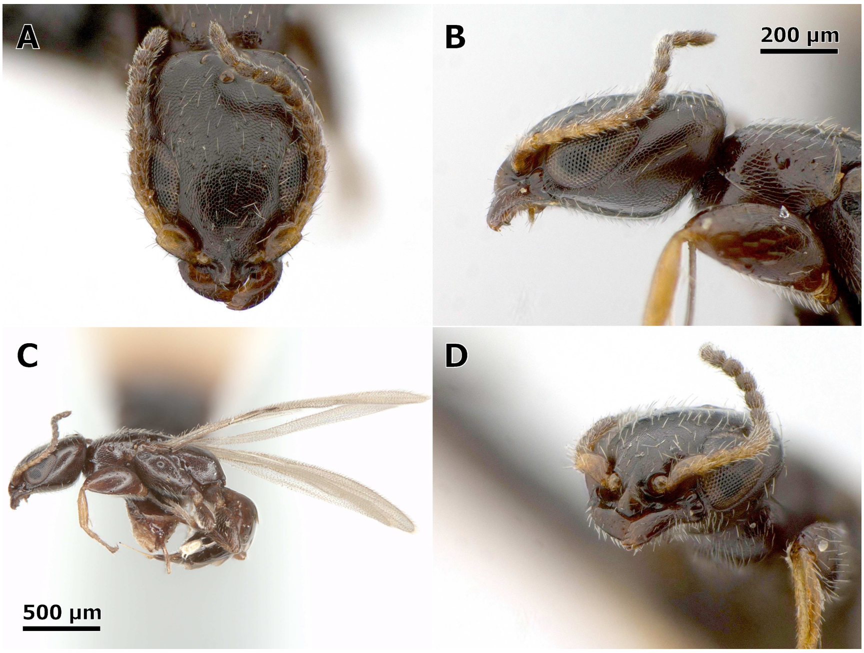


Figure 14. *Sierola curvignatha*. A: head, dorsal. B: head, lateral. C: lateral habitus. D: head, frontal.

Discussion. The holotype is lacking closure of cell 2R1, which would key it to *Goniozus (Parasierola)*, but a vein is present on the wing margin that is not present in true “Parasierola”. See comments under *S. pololei* n. sp.

***Sierola curvignatha* Fullaway, 1920**
Figure 14, Map 4

Sierola curvignatha Fullaway, 1920: 79.

Island. Hawai‘i.

Diagnosis. Distinguished by the convex clypeus, narrow head, densely setose basal wing cells, and head strongly convex dorsally. Separated from the similar *S. konana* Fullaway and *S. kahuku* Magnacca of O‘ahu by the much narrower head (~0.73 vs. 0.85–0.94) and lack of a distinct malar space.

Description. **Female**. *Head*. Clypeal process semicircular, apex broadly rounded; dorsally rounded, convex, lacking a carina; in profile evenly curved from base to apex, apical angle slightly acute. Mandible narrow, slightly expanded at base and apex, ventral margin weakly concave; strongly twisted, outwardly polished, smooth, shining; in ventral view evenly, moderately curved. Apex of mandible vertical, with equally strong teeth. Malar space very small. Dorsal setae of head about as long as flagellar width or scarcely longer. Frons with shallow, uneven punctures, 1–3 pit widths apart. Vertex and gena setae similar to and only slightly longer than setae of frons. Frons microsculpture coriaceous, matte but without strong surface texture. Vertex in dorsal view more or less straight; occipital margin broadly rounded. Lateral ocelli distinctly separate from vertex crest by less than ocellus length. Ocellar triangle front angle weakly acute. Head broadening posterior to eyes. Dorsum of head in lateral view strongly convex, head deepest on line through just posterior of eye. Venter of head posterior to mandible convex in lateral view, with relatively sparse setae.

Head evenly convex ventrally, genal angle absent. Postgenal depression very shallow, nearly absent. Antenna extending to pronotum.

Mesosoma. Anterior margin of dorsal pronotal area in lateral view evenly rounded. Pronotal setae longer than flagellar width. Propodeal disc laterally finely, weakly striate; metapleural carinae present posteriorly, fading anteriorly. Fore femur only moderately expanded, more than twice as long as wide, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Highly polished, without a trace of microsculpture. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Body entirely dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible black. Coxae and femora dark brown to black, fore tibia and tarsus and all trochanters yellow, mid and hind tibiae and tarsi brownish.

Wings. Membrane hyaline. Basal cells of fore wing densely and conspicuously setose.

Measurements. LFW 1.91 mm; LM 0.95 mm; WH/LH 0.73; DH/LH 0.51; EV/HE 0.91; EV/WF 1.00; WF/HE 0.91; WH/WF 1.85; OOL/WOT 1.90; DM/LM 0.39; FL/FW 2.40; HFL/HFW 2.52; A3 L/W 1.00.

Type Material. Holotype ♀. Hawai‘i: Kīlauea, 4,000 ft [1,220 m], taken at the lumber camp, 4 Jul 1918, W.M. Giffard, BPBMENT 0000000015.

Material examined: 1♀, N of Kailua: new road, 108 m, sweeping *Schinus*, 17 Oct 1992, G.M. Nishida, BPBM. 1♀, N of Kailua: new road, 110 m, sweeping *Schinus*, 17 Oct 1992, G.M. Nishida, BPBM.

Distribution. Rare, known only from the holotype, collected in 1918 at Kīlauea, and two recent specimens from Kona. The latter are unusually low elevation records for *Sierola* in Hawai‘i.

***Sierola distinctella* n. sp.**

Figure 15, Map 5

Island. Hawai‘i.

Diagnosis. Closely related to *S. ihupehu* n. sp. and *S. oahuensis* Fullaway of O‘ahu, but strikingly different in the clypeus which is short and semicircular rather than expanded and spatulate beyond the base, and the mandible is short and compact. The head shape in lateral view is also very different from *S. ihupehu*, lacking the peculiar modifications of that species.

Description. **Female**. *Head*. Clypeal process semicircular, apex broadly rounded; dorsally rounded, convex, lacking a carina; in profile steep and short, evenly curved. Mandible moderately narrow at base, distinctly broader on apical half, ventral margin distinctly concave; slightly twisted, outwardly shining but with distinct, fine microsculpture; in ventral view distinctly elbowed externally, internal margin nearly straight. Apex of mandible strongly oblique, with a single large ventral tooth and a few small teeth on inner margin. Malar space 1/2 as long as width of base of mandible. Dorsal setae of head shorter than flagellar width. Frons with sparse, scattered punctures, mostly 3 pit widths apart or more. Vertex and gena setae similar to and only slightly longer than setae of frons. Frons microsculpture finely microreticulate, surface weakly matte. Vertex in dorsal view more or less straight; occipital margin narrowly rounded. Lateral ocelli distinctly separate from vertex crest by less than ocellus length. Ocellar triangle front angle weakly acute. Head more or less parallel-sided for some distance posterior to eyes. Dorsum of head in lateral view slightly convex, head deepest on line well posterior of eye. Venter of head posterior to mandible flat in lateral view, with relatively sparse setae. Genal angle broadly rounded. Gena ventral to eye concave. Postgenal depression deep, distinct, broad. Antenna extending to mesonotum.

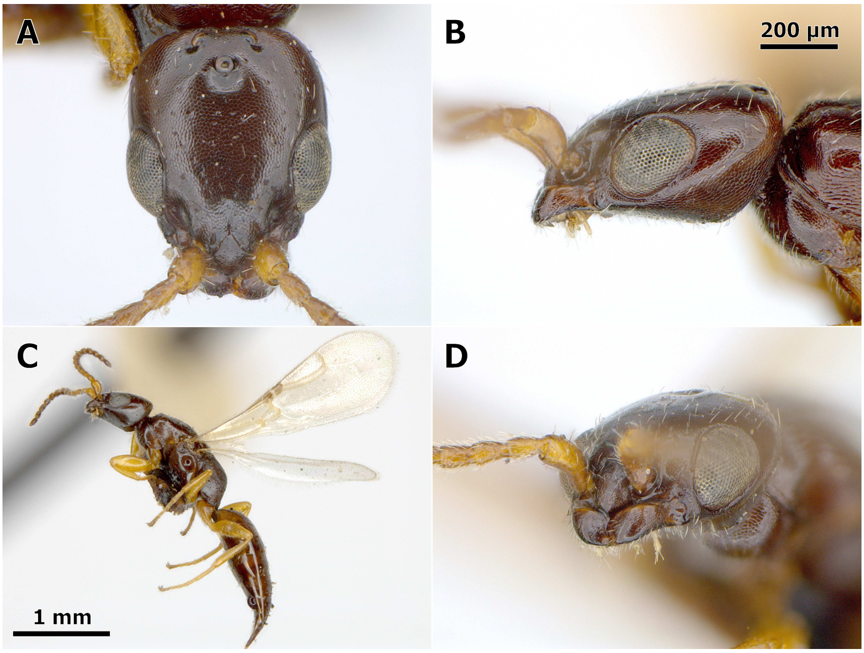


Figure 15. *Sierola distinctella*. A: head, dorsal. B: head, lateral. C: lateral habitus. D: head, frontal.

Mesosoma. Anterior margin of dorsal pronotal area in lateral view evenly rounded. Pronotal setae short, inconspicuous. Propodeal disc laterally coarsely rugulose; median carina faintly present; transverse carina faintly present, curving on each side; metapleural carinae complete. Fore femur only moderately expanded, more than twice as long as wide, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with faint microsculpture laterally, or with very faint microreticulation over posterior terga. Sixth sternum narrowly glabrous medially, laterally with dense pilose setae.

Color. Body entirely dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible black. Coxae brown, legs otherwise yellow.

Wings. Membrane hyaline. Basal cells of fore wing nearly glabrous, with only few scattered setae. Cell 1M distinctly convex posteriorly, corner medioapical.

Measurements. LFW 1.97 mm; LM 1.01 mm; WH/LH 0.82; DH/LH 0.56; EV/HE 0.98; EV/WF 0.76; WF/HE 1.30; WH/WF 1.64; OOL/WOT 1.42; DM/LM 0.40; FL/FW 2.40; HFL/HFW 2.96; A3 L/W 1.50; 2R1 L/W 3.14.

Type Material. Holotype ♀. Hawaiʻi: Kīlauea, 4,000 ft [1,220 m], Jan 1916, W.M. Giffard, BPBMENT 0000018077.

Etymology. Referring to the similarity of this species to *S. oahuensis* Ashmead of Oʻahu and its junior synonym, *S. distincta* Fullaway. The unique holotype was originally a paratype of the latter.

Distribution. Known only from the holotype, taken at Kīlauea in 1916.

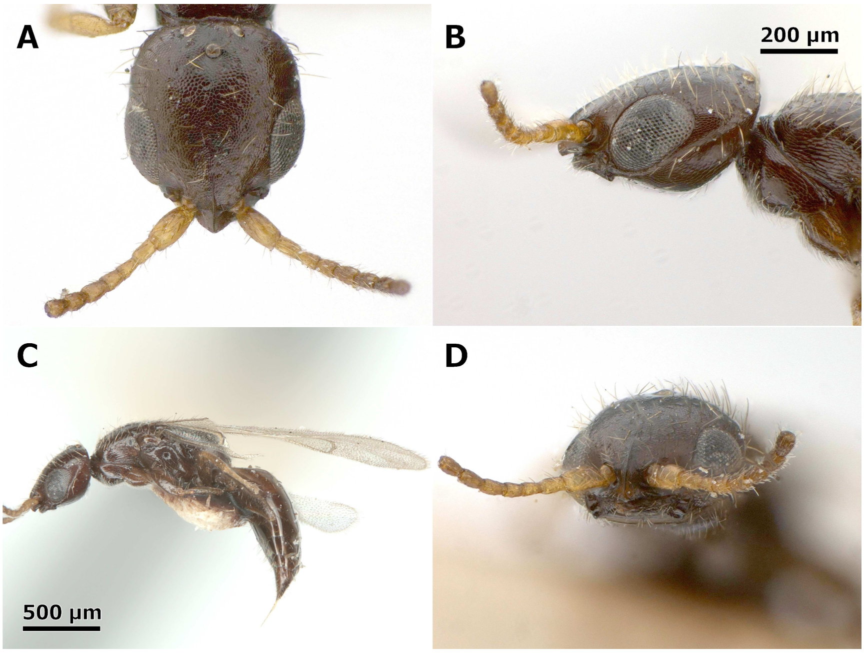


Figure 16. *Sierola ehrhorni*. A: head, dorsal. B: head, lateral. C: lateral habitus. D: head, frontal.

***Sierola ehrhorni* Fullaway, 1920**

Figure 16, Map 6

Sierola ehrhorni Fullaway, 1920: 117.

Island. Hawai‘i.

Diagnosis. Belonging in the group of species with a highly arched, thin clypeal carina, strong, conspicuous vertex and gena setae, and densely punctate frons. Separated from *S. indecora* Fullaway and *S. kilauea* Fullaway by having the lateral ocelli narrowly but distinctly separate from the vertex crest, and additionally from the latter by the usually narrower femora. Very close to *S. eucrena* Fullaway, distinguished by having the legs all dark, median propodeal carina absent, and mandible always black.

Description. **Female**. *Head*. Clypeal process rounded triangular, apex weakly pointed; dorsally with a thin, laminar carina, the sides strongly concave; in profile strongly arched, vertical or slightly recurved at apex, carina extending above antennal sockets. Mandible narrow, more or less parallel-sided except at base; not twisted, at most weakly convex outwardly, outwardly coriaceous, somewhat dull; in ventral view evenly, moderately curved. Apex of mandible vertical, with equally strong teeth. Malar space very small. Dorsal setae of head distinctly longer than flagellar width. Frons with shallow punctures, dense near antennae, 2–3 pit widths apart posterior of midpoint of eyes. Vertex and gena setae conspicuous, nearly twice as long as setae of frons and stronger, erect and directed anterior. Frons microsculpture coriaceous, matte but without strong surface texture. Vertex in dorsal view more or less straight; occipital margin not carinate but forming a pronounced ridge. Lateral ocelli distinctly separate from vertex crest by less than ocellus length. Ocellar triangle front angle right. Head more or less parallel-sided for some distance posterior to eyes. Dorsum of head in lateral view slightly convex, head deepest on line through eye. Venter of head posterior to mandible convex in lateral view, with relatively sparse setae. Head evenly convex ventrally, genal angle absent. Gena ventral to eye flat. Postgenal depression absent.

Mesosoma. Anterior margin of dorsal pronotal area in lateral view evenly rounded. Pronotal setae elongate, twice as long as flagellar width or more. Propodeal disc laterally coarsely striate; metapleural carinae complete. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with faint microsculpture laterally. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Body entirely dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible black. Coxae and femora dark brown to black, tibiae, tarsi, and trochanters brownish orange.

Wings. Membrane tinged with yellow. Basal cells of fore wing densely and conspicuously setose.

Measurements. LFW 1.93 mm; LM 0.92 mm; WH/LH 0.85 (0.84–0.85); DH/LH 0.60 (0.55–0.60); EV/HE 0.80 (0.64–0.83); EV/WF 0.66 (0.62–0.66); WF/HE 1.20 (1.03–1.34); WH/WF 1.61 (1.61–1.79); OOL/WOT 1.24 (1.09–1.24); DM/LM 0.43; FL/FW 2.13 (2.13–2.25); HFL/HFW 2.85 (2.78–2.90); A3 L/W 1.35 (1.35–1.43); 2R1 L/W 2.85. N = 4.

Type Material. Holotype ♀. Hawai‘i: Kīlauea, 4,000 ft [1,220 m], Jan 1916, W.M. Giffard, BPBMENT 0000000090.

Material examined: 1♀, Kīlauea, Aug 1896, R.C.L. Perkins, BPBM. 1♀, Kīlauea, old crack, 4,000 ft [1,220 m], 8 Sep 1919, W.M. Giffard, HDOA. 1♀, 23 Miles, ‘Ōla‘a, 2,300 ft [700 m], 9 Sep 1919, W.M. Giffard, HDOA. 1♀, Mt Hualālai, 4,000 ft [1,220 m], Capt. Cook above, 12 May 1959, C.M. Yoshimoto & S. Kimoto, BPBM. 1♀, Kīlauea–Ka‘ū, 4,000 ft [1,220 m], 22 Jun 1966, J.W. Beardsley, BPBM. 1♀, Pu‘u Hualālai, 900–1,200 m, 27–28 Jun 1966, J.W. Beardsley, BPBM. 1♀, Kohala Mts., behind Kamuela, 3,500 ft [1,070 m], 29 Jun 1966, J.W. Beardsley, BPBM. 1♀, Kīlauea Forest Reserve IBP study site, 1,586 m, Malaise Trap #2, WAS #71–71, 16–23 Aug 1971, W.A. Steffan, BPBM. 1♀ 1♂, Pu‘u Wa‘awa‘a, 3,700 ft [1,130 m], 19.7730°N 155.8353°W, sweeping *Pisonia brunoniana*, 4 Aug 2009, K.N. Magnacca, KNMC. 1♀, Pu‘u Wa‘awa‘a, West Kīleo, 4,300 ft [1,300 m], 19.7345°N 155.8359°W, beating *Santalum*, 27 Jan 2012, K.N. Magnacca, KNMC.

Distribution. Widespread around the island, in both wet and dry forest.

Discussion. See comments under *S. eucrena*.

***Sierola ekoa* n. sp.**

Figure 17, Map 5

Island. Hawai‘i.

Diagnosis. Easily recognized by the combination of a weakly carinate clypeus which is short and steeply curved in profile, moderately narrow frons, and very narrow fore femur. The fore femur is narrower than the hind femur, which is very unusual. The head is somewhat deep and broad, similar to *S. okala* n. sp., but lacking the unusual frons microsculpture of that species.

Description. **Female**. *Head*. Clypeal process semi-elliptical or very short, almost transverse, extending only slightly beyond lateral portion of clypeus, apex broadly rounded; dorsally weakly carinate; in profile steep and short, evenly curved. Mandible moderately narrow, slightly narrowed medially from base, ventral margin weakly concave; slightly twisted, outwardly coriaceous, somewhat dull; in ventral view evenly, moderately curved. Apex of mandible vertical, with teeth distinctly stronger ventrally. Malar space almost absent. Dorsal setae of head distinctly longer than flagellar width. Frons with shallow, uneven punctures, 1–3 pit widths apart. Vertex and gena setae similar to and only slightly longer than setae of frons. Frons microsculpture finely microreticulate, surface weakly matte. Vertex in dorsal view more or less straight; occipital margin broadly rounded. Lateral ocelli nearly touching vertex crest, or distinctly separate from vertex crest by less than ocellus length. Ocellar triangle front angle weakly to strongly acute. Head more or less parallel-sided for some distance posterior to eyes. Dorsum of head in lateral view slightly convex or nearly flat posterior to middle of eyes, head deepest on line through posterior margin of eye. Venter of head posterior to mandible convex in lateral view, with relatively sparse setae.

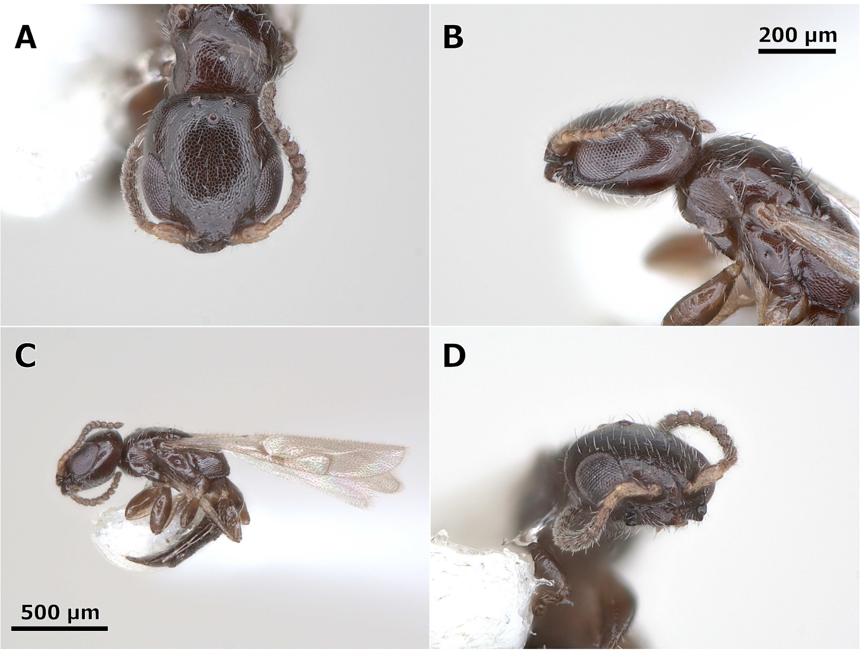


Figure 17. *Sierola ekoa.* A: head, dorsal. B: head, lateral. C: lateral habitus. D: head, frontal.

Head weakly convex ventrally, genal angle absent. Postgenal depression very shallow, nearly absent. Antenna extending to posterior margin of pronotum.

Mesosoma. Anterior margin of dorsal pronotal area in lateral view evenly rounded. Pronotal setae longer than flagellar width. Propodeal disc laterally shining, with weak microsculpture; metapleural carinae present posteriorly, fading anteriorly. Fore femur only moderately expanded, more than twice as long as wide, with both anterior and posterior surfaces convex, not strongly compressed, more or less straight in dorsal view.

Metasoma. Shining, with faint microsculpture laterally. Sixth sternum narrowly glabrous medially, laterally with dense pilose setae.

Color. Body entirely dark brown to black. Antenna entirely dark brown except ventral side of basal segments yellowish. Mandible black. Coxae, trochanters, and femora dark brown, tibiae brown, tarsi yellow.

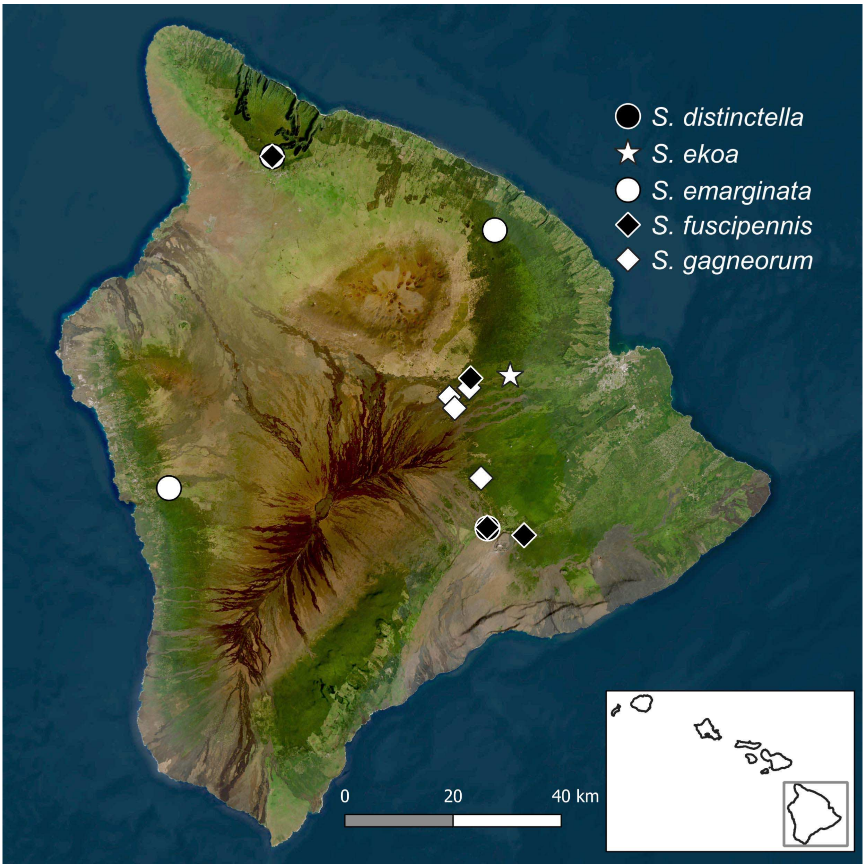
Wings. Membrane hyaline. Basal cells of fore wing with intermediate setation, each with two complete rows and a few additional setae. Cell 1M weakly convex posteriorly, corner posteroapical.

Measurements. LFW 1.34 mm; LM 0.62 mm; WH/LH 0.89; DH/LH 0.59; EV/HE 0.71; EV/WF 0.65; WF/HE 1.09; WH/WF 1.72; OOL/WOT 1.35; DM/LM 0.43; FL/FW 2.38; HFL/HFW 2.23; A3 L/W 1.32; 2R1 L/W 2.47.

Type Material. Holotype ♀. Hawai‘i: Saddle Rd: milepost 14, Saddle Rd realignment project: EX-3, 163+000, 20 Aug 1996, G.M. Nishida, BPBMENT 0000018078.

Etymology. From the Hawaiian *‘ēko‘a*, opposite, referring to the hind femur being wider than the fore, the reverse of the usual form.

Distribution. Known only from the holotype, collected in wet forest on the windward slope of Mauna Loa.



Map 5. Collection localities of *Sierola distinctella, S. ekoa, S. emarginata, S. fuscipennis*, and *S. gagneorum*.

Sierola emarginata Fullaway, 1920

Figure 18, Map 5

Sierola emarginata Fullaway, 1920: 79.

Island. Hawai‘i.

Diagnosis. Readily distinguished from all other species by the combination of the clypeus flat dorsally, mandible falcate, and vertex broadly, deeply emarginate in dorsal view. Closest to *S. concava* Magnacca and *S. giffardi* Fullaway of O‘ahu; differing in having the mandible parallel-sided and not twisted, WF/HE just over 1 rather than 1.2–1.3, and OOL/WOT in between those two species.

Description. **Female**. *Head*. Clypeal process rounded triangular, apex rounded; dorsally flat, not carinate, slightly convex only laterally; in profile evenly sloping, nearly straight. Mandible moderately narrow, more or less parallel-sided except at base; not twisted, at most weakly convex outwardly, outwardly polished, smooth, shining; in ventral view strongly elbowed. Apex of mandible strongly oblique, falcate, lacking subapical teeth. Malar space 1/3 as long as width of base of mandible. Dorsal setae of head about as long as flagellar width or scarcely longer. Frons with distinct, uneven punctures, 1–3 pit widths apart. Vertex and gena setae similar to and only slightly longer than setae of frons. Frons microsculpture evident but smooth, shining. Vertex in dorsal view broadly, deeply concave; occipital margin broadly rounded. Lateral ocelli nearly touching vertex crest. Ocellar trian-

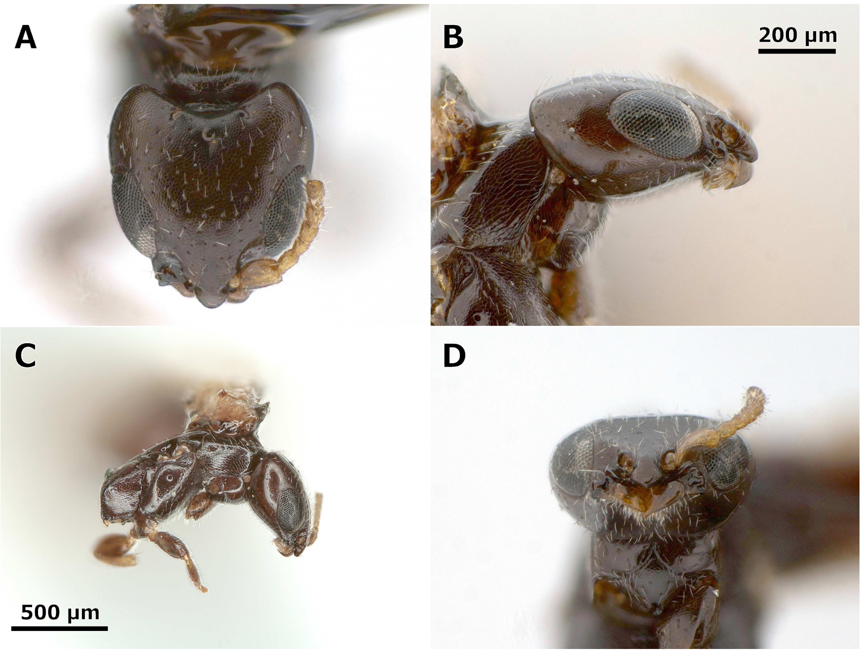


Figure 18. *Sierola emarginata*. A: head, dorsal. B: head, lateral. C: lateral habitus. D: head, frontal.

gle front angle strongly obtuse. Head broadening posterior to eyes. Dorsum of head in lateral view slightly convex, head deepest on line through posterior margin of eye. Venter of head posterior to mandible flat in lateral view, with relatively sparse setae. Genal angle broadly rounded. Postgenal depression very shallow, nearly absent. Antenna extending to pronotum.

Mesosoma. Anterior margin of dorsal pronotal area in lateral view strongly angulate. Pronotal setae longer than flagellar width. Propodeal disc laterally finely, weakly striate; metapleural carinae present posteriorly, fading anteriorly.

Metasoma. Shining, with faint microsculpture laterally. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Body entirely dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible black. Coxae and femora dark brown to black, all tibiae and tarsi yellow-brown.

Wings. Membrane hyaline. Basal cells of fore wing densely and conspicuously setose.

Measurements. LFW 1.68 mm; LM 0.98 mm; WH/LH 0.91; DH/LH 0.53; EV/HE 0.76; EV/WF 0.73; WF/HE 1.05; WH/WF 1.95; OOL/WOT 0.81; DM/LM 0.38; A3 L/W 1.00.

Type Material. Holotype ♀. Hawai‘i: Hawai‘i, [no specific location, no date], A. Koebele, BPBMENT 0000000016.

Material examined: 1♀, Kealakekua, 3,500 ft [1,070 m], on ohia lehua, 16 Aug 1919, P.H. Timberlake, UCRC ENT 556764. 2♀, Kohala Forest Reserve, 1,158 m, fogging *Metros. polymorpha*, 14 Oct 1997, D.S. Gruner & D.A. Polhemus (specimens: 11–3, GRU 0709–005; 9–2 GRU 0711–004), BPBM. 1♀, Laupāhoehoe, 1,170 m, 19.9302°N 155.2906°W, Malaise trap, 5 Dec 2022–9 Apr 2023, K.N. Magnacca, BPBM.

Distribution. Rare, known only from five specimens, but collected recently.

Discussion. The type is heavily damaged – the metasoma is broken off and glued onto the point, as is one wing (the other is missing), and only the middle legs and half of one antenna are present. However, all the characters of the head are readily visible.

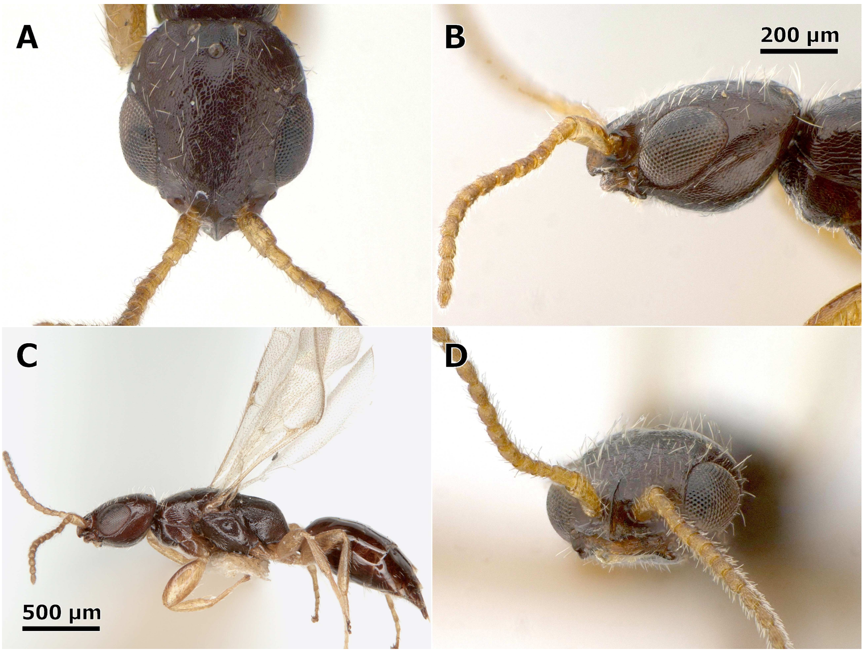


Figure 19. *Sierola eucrena*. A: head, dorsal. B: head, lateral. C: lateral habitus. D: head, frontal.

Sierola eucrena **Fullaway, 1920**

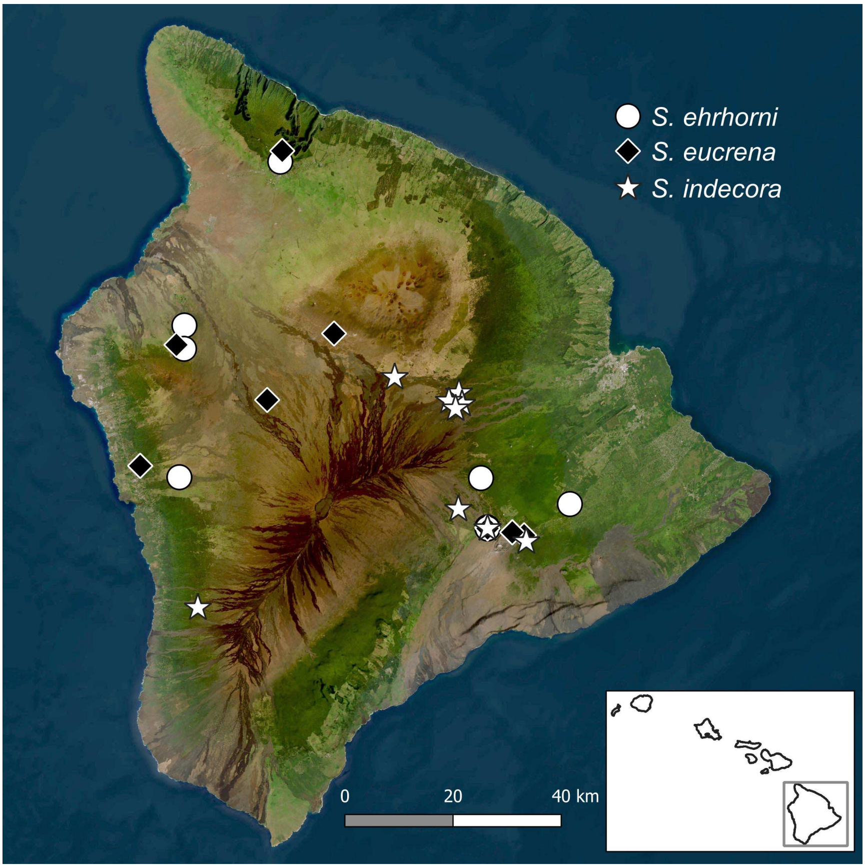
Figure 19, Map 6

Sierola eucrena Fullaway, 1920: 117.
Sierola longicornis Fullaway, 1920: 101 **n. syn.**

Island. Hawai'i.

Diagnosis. Belonging in the group of species with a highly arched, thin clypeal carina, strong, conspicuous vertex and gena setae, and densely punctate frons. Separated from *S. indecora* Fullaway and *S. kilauea* Fullaway by having the lateral ocelli narrowly but distinctly separate from the vertex crest, and additionally from the latter by the usually narrower femora. Very close to *S. ehrhorni* Fullaway, distinguished by having the legs predominantly yellow (femora sometimes brownish but tibiae always yellow), median propodeal carina usually present and distinct, and mandible usually reddish brown.

Description. **Female**. *Head*. Clypeal process rounded triangular, apex weakly pointed; dorsally with a thin, laminar carina, the sides strongly concave; in profile strongly arched, vertical or slightly recurved at apex, carina extending above antennal sockets. Mandible narrow, more or less parallel-sided except at base; not twisted, at most weakly convex outwardly, outwardly coriaceous, somewhat dull; in ventral view evenly, moderately curved. Apex of mandible vertical, with equally strong teeth. Malar space very small. Dorsal setae of head distinctly longer than flagellar width. Frons with shallow, close punctures, mostly about 1 pit width apart. Vertex and gena setae conspicuous, nearly twice as long as setae of frons and stronger, erect and directed anterior. Frons microsculpture dull, granular, or coriaceous, matte but without strong surface texture. Vertex in dorsal view more or less straight; occipital margin not carinate but forming a pronounced ridge. Lateral ocelli distinctly separate from vertex crest by less than ocellus length. Ocellar triangle front angle right. Head narrowed posterior to eyes. Dorsum of head in lateral view slightly convex, head deepest on line through eye. Venter of head posterior to mandible convex in lateral view, with rel-



Map 6. Collection localities of *Sierola ehrhorni, S. eucrena*, and *S. indecora*.

atively sparse setae. Head evenly convex ventrally, genal angle absent. Gena ventral to eye flat. Postgenal depression absent. Antenna extending to mesonotum.

Mesosoma. Anterior margin of dorsal pronotal area in lateral view evenly rounded. Pronotal setae longer than flagellar width. Propodeal disc laterally coarsely striate; median carina faintly present; metapleural carinae complete. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with faint microsculpture laterally. Sixth sternum narrowly glabrous medially, laterally with dense pilose setae.

Color. Body entirely dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible black to orange (usually reddish brown). Legs all yellow except dorsal margins of femora tinged with brown (rarely femora mostly dark).

Wings. Membrane tinged with yellow. Basal cells of fore wing densely and conspicuously setose.

Measurements. LFW 1.86 mm; LM 0.94 mm; WH/LH 0.87 (0.83–0.87); DH/LH 0.59 (0.55–0.60); EV/HE 0.79 (0.65–0.79); EV/WF 0.69 (0.60–0.71); WF/HE 1.15 (1.05–1.15); WH/WF 1.69 (1.69–1.77); OOL/WOT 1.32 (1.20–1.32); DM/LM 0.42; FL/FW 2.18 (2.07–2.32); HFL/HFW 2.71 (2.64–3.00); A3 L/W 1.51 (1.33–1.75); 2R1 L/W 3. N = 10.

Type Material. Holotype ♀ of *Sierola eucrena*. Hawai‘i: Hawai‘i, [no specific location, no date], A. Koebele, BPBMENT 0000000089.

Holotype ♀ of *Sierola longicornis*. Hawai‘i: 29 miles, Kīlauea, Jan 1915, W.M. Giffard, BPBMENT 0000000057.

Material examined: 1♀, Kona, 2,000 ft [600 m], [right and left specimens on card], Sep 1892, R.C.L. Perkins, NHMUK 013380207. 3♀, Kīlauea, Aug 1895, R.C.L. Perkins, NHMUK 013380198, 013380199, 013380203. 1♀, Kīlauea, 686, Aug 1896, R.C.L. Perkins, USNM. 3♀, Steam Crack, Kīlauea, 3,800 ft [1,160 m], 6 Sep 1919, W.M. Giffard, HDOA. 1♀, Kīlauea, old crack, 4,000 ft [1,220 m], 8 Sep 1919, W.M. Giffard, HDOA. 1♀, Upper Hāmākua Ditch Trail, *Broussaisia*, 30 Jul 1921, O.H. Swezey, BPBM. 1♀, Pōhakuloa, 1,800 m, 21 Jun 1966, J.W. Beardsley, BPBM. 1♀, Pu‘u Wa‘awa‘a, Wildlife Sanctuary Boundary, 4,000 ft [1,220 m], 19.7410°N 155.8493°W, beating *Santalum*, 25 Oct 2012, K.N. Magnacca, KNMC.

Distribution. Widely distributed in similar habitats as *S. ehrhorni* and *S. scoriacea*, but much less common.

Discussion. Fullaway (1920) separated *S. longicornis* from other species by the long antennae, described as having “all the segments more than twice as long as wide”. However, in the unique type, the antennal segments are about 1.7 times longer than wide at most, close to the range of variation otherwise found in *S. eucrena* (A3 L/W 1.33–1.58). The slightly greater length does not seem worthy of erecting a separate species. In Fullaway’s key they are separated based on the wing coloration (“yellowish brown” for *S. longicornis*, “hyaline, subinfuscate, or with only a faint yellowish brown” for *S. eucrena*), but again both species have the wings subhyaline with only a faint yellowish tinge. The key features of *S. eucrena*, namely the strongly rounded posterior corners of the head, lateral ocelli separate from the vertex crest, and propodeal median carina present, are all found in the type of *S. longicornis*. Therefore, I consider them synonyms. This species may also be synonymous with *S. ehrhorni* – in general, the character states of median propodeal carina present, predominantly yellow legs, and reddish mandible are found together, but a few specimens have only two of these, with the third of the *S. ehrhorni* type. Color characters may not always be reliable, particularly in older specimens, so further investigation is needed. Two specimens with dark legs, black mandible, and a faint propodeal carina, here identified as *S. ehrhorni*, may represent a third species as they have the femora broader than all specimens of either *S. ehrhorni* or *S. eucrena*.

***Sierola fuscipennis* Fullaway, 1920**

Figure 20, Map 5

Sierola fuscipennis Fullaway, 1920: 91.

Island. Hawai‘i.

Diagnosis. Part of a large complex of species with a sharp, curved to arched clypeal carina, densely setose basal wing cells, lateral ocelli distinctly separate from the vertex crest, and head deep (DH/LH ≥0.59). Separated by having the frons dull and granular, vertex and gena setae short and similar to those of the frons, and mandible moderately broad. Similar to *S. illingworthi* Fullaway in the frons sculpture and mandible width, primarily separated by the setae.

Description. **Female**. *Head*. Clypeal process semicircular, apex broadly rounded; dorsally with a sharp carina; in profile evenly curved from base to apex, apical angle slightly acute. Mandible moderately broad, more or less parallel-sided except at base; not twisted, at most weakly convex outwardly, outwardly coriaceous, somewhat dull; in ventral view evenly, moderately curved. Apex of mandible slightly oblique, with equally strong teeth. Malar space very small. Dorsal setae of head about as long as flagellar width or scarcely longer. Frons with shallow punctures, dense near antennae, 2–3 pit widths apart posterior of midpoint of eyes. Vertex and gena setae similar to and only slightly longer than setae of frons. Frons microsculpture dull, granular. Vertex in dorsal view more or less straight; occipital margin broadly rounded. Lateral ocelli distinctly separate from vertex crest by less than ocellus length. Ocellar triangle front angle weakly acute. Head rounded shortly poste-

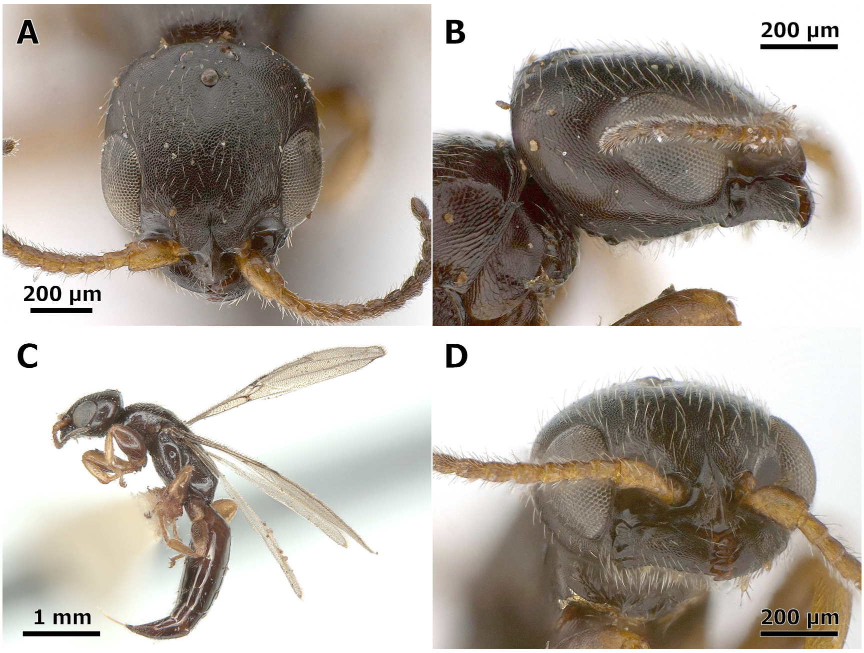


Figure 20. *Sierola fuscipennis*. A: head, dorsal. B: head, lateral. C: lateral habitus. D: head, frontal.

rior to eyes. Dorsum of head in lateral view strongly convex, head deepest on line through posterior margin of eye. Venter of head posterior to mandible convex in lateral view, with moderately dense pubescence. Head evenly convex ventrally, genal angle absent. Postgenal depression shallow, rounded. Antenna extending to pronotum.

Mesosoma. Anterior margin of dorsal pronotal area in lateral view evenly rounded. Pronotal setae longer than flagellar width. Propodeal disc laterally shining, with weak microsculpture; metapleural carinae complete. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with very faint microreticulation over posterior terga. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Body entirely dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible black. Coxae and femora dark brown to black, tibiae, tarsi, and trochanters yellow.

Wings. Membrane tinged with yellow. Basal cells of fore wing densely and conspicuously setose.

Measurements. LFW 2.60 mm; LM 1.37 mm; WH/LH 0.92; DH/LH 0.60; EV/HE 0.75; EV/WF 0.58; WF/HE 1.29; WH/WF 1.61; OOL/WOT 1.50; DM/LM 0.41; FL/FW 2.05; HFL/HFW 2.24; A3 L/W 1.25.

Type Material. Holotype ♀. Hawai‘i: Shipman Ranch, Kīlauea, 14 Jan 1917, F. Muir, BPBMENT 0000000039.

Material examined: 1♀, Kīlauea, Sep 1895, R.C.L. Perkins, NHMUK 013380250 [right specimen on card]. 1♀, Kohala Forest Reserve, 1,158 m, fogging *Metros. polymorpha*, 1–1, GRU 0436–003, 12 Oct 1997, D.S. Gruner & D.A. Polhemus, BPBM.

Distribution. Known only from the holotype, another taken by Perkins, and one recent specimen, all collected in wet forest.

Discussion. One of Fullaway's paratypes is a specimen of *S. illingworthi* Fullaway; the other is *S. kilauea* Fullaway. This and several other species (*S. illingworthi*, *S. levigata* Fullaway, and *S. newelli* Fullaway) form a relatively well-defined complex characterized

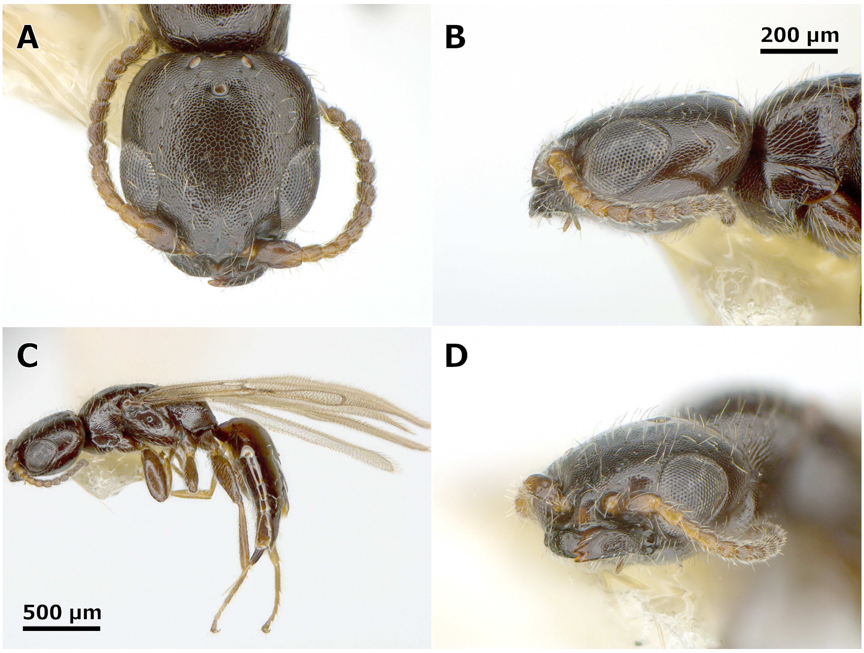


Figure 21. *Sierola gagneorum*. A: head, dorsal. B: head, lateral. C: lateral habitus. D: head, frontal.

by having a sharp clypeal carina, densely setose basal wing cells, lateral ocelli distinctly separate from the vertex crest, and head broad and deep. All are extremely rare and somewhat difficult to distinguish, and it is possible that with more specimens available, the species definitions might shift. A broader grouping would include *S. compacta* Fullaway, *S. nemorensis* Fullaway, and *S. opakapaka* n. sp., but the latter three are much more distinctive.

Sierola gagneorum n. sp.

Figure 21, Map 5

Island. Hawai‘i.

Diagnosis. Easily distinguished by the short, steeply curved, weakly carinate clypeus; evenly coriaceous frons microsculpture; relatively broad, compact head; and densely setose basal wing cells. Closest to *S. affinis* Fullaway of O‘ahu; separated by the narrower mandible, dark legs, lateral ocelli separated from the vertex by less than an ocellus width, and OOL/WOT ~1.3 rather than 1.75–1.92.

Description. **Female**. *Head*. Clypeal process semi-elliptical, apex broadly rounded; dorsally weakly carinate; in profile steep and short, evenly curved. Mandible moderately narrow, more or less parallel-sided except at base; not twisted, at most weakly convex outwardly, outwardly coriaceous, somewhat dull; in ventral view evenly, moderately curved. Apex of mandible vertical, with teeth distinctly stronger ventrally. Malar space very small. Dorsal setae of head about as long as to distinctly longer than flagellar width. Frons with shallow punctures, dense near antennae, 2–3 pit widths apart posterior of midpoint of eyes. Vertex and gena setae similar to and only slightly longer than setae of frons. Frons microsculpture coriaceous, matte but without strong surface texture. Vertex in dorsal view more or less straight; occipital margin broadly rounded. Lateral ocelli distinctly separate from vertex crest by less than ocellus length. Ocellar triangle front angle weakly acute. Head more or less parallel-sided for some distance posterior to eyes. Dorsum of head in lateral view slightly convex (flattened between eyes and ocelli), head deepest on line through posterior margin of eye. Venter of head posterior to mandible convex in lateral view, with relatively sparse setae. Head evenly convex ventrally, genal angle absent. Postgenal depression very shallow, nearly absent. Antenna extending to posterior margin of pronotum.

Mesosoma. Anterior margin of dorsal pronotal area in lateral view evenly rounded. Pronotal setae longer than flagellar width. Propodeal disc laterally coarsely striate; metapleural carinae complete. Fore femur only moderately expanded, more than twice as long as wide, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Highly polished, without a trace of microsculpture. Sixth sternum narrowly glabrous medially, laterally with dense pilose setae.

Color. Body entirely dark brown to black. Antenna entirely dark brown except ventral side of basal segments yellowish. Mandible black. Legs all dark brown to black.

Wings. Membrane tinged with yellow. Basal cells of fore wing very densely setose, with five or more rows of setae in cell R. Cell 1M weakly convex posteriorly, corner posteroapical.

Measurements. LFW 2.06 mm; LM 0.94 mm; WH/LH 0.89; DH/LH 0.59; EV/HE 0.86; EV/WF 0.71; WF/HE 1.20; WH/WF 1.71; OOL/WOT 1.32; DM/LM 0.43; FL/FW 2.43; HFL/HFW 2.55; A3 L/W 1.33; 2R1 L/W 2.74.

Type Material. Holotype ♀. Hawai‘i: Kīlauea Forest Reserve IBP study site, 1,586 m, Malaise Trap #2, WAS #71–71, 15–22 Mar 1971, W.A. Steffan & W.C. Gagné, BPBMENT 0000018079. Paratypes: 1♀, So. Hilo Dist., Kīpuka nr. Mawae (Kīpuka #14), Saddle Rd, 23 Oct 1996, M.J. & C.A. Tauber, BPBM. 1♀, Upper Waiākea FR, kīpuka 30, 1,726 m, 19.6547°N 155.3703°W, ‘ōhi‘a canopy branch clipping, collection K30-TR2–2009, lot HI-1155, 27 Aug 2009, D. Leopold & B. Hwang, BPBM. 2♀, Upper Waiākea FR, kīpuka 38, 1,739 m, 19.6363°N 155.3608°W, ‘ōhi‘a canopy branch clipping, collection 319, lot H.12.234, 19 Apr 2012, E.E. Wilson & D. Leopold, USNM.

Etymology. Named for the late Wayne and Betsy Gagné, who made enormous contributions to Hawaiian conservation and influenced generations of scientists and conservationists including myself.

Distribution. Very rare, known only from a handful of specimens collected on windward Mauna Loa.

***Sierola graciloides* n. sp.**

Figure 22, Map 7

Island. Hawai‘i.

Diagnosis. Distinguished from other species with a flat clypeus by the densely setose basal wing cells, moderately twisted mandible with an enlarged ventral tooth (which may be mistaken for falcate if not clearly visible), and moderately broad head. Very similar to *S. gracilis* Fullaway of Oahu, differing in the deeper head.

Description. **Female**. *Head*. Clypeal process short, triangular, apex pointed; dorsally flat, not carinate, slightly convex only laterally; in profile evenly sloping, nearly straight. Mandible moderately narrow at base, distinctly broader on apical half, ventral margin distinctly concave; slightly twisted, outwardly coriaceous, somewhat dull; in ventral view strongly elbowed. Apex of mandible slightly oblique, with teeth distinctly stronger ventrally. Malar space very small. Dorsal setae of head about as long as flagellar width or scarcely longer. Frons with distinct, uneven punctures, 1–3 pit widths apart. Vertex and gena setae distinctly longer than frons setae but only about as thick, not particularly conspicuous. Frons microsculpture finely microreticulate, surface weakly matte. Vertex in dorsal view more or less straight; occipital margin narrowly rounded. Lateral ocelli nearly touching vertex crest. Ocellar triangle front angle weakly obtuse. Head more or less parallel-sided for some distance posterior to eyes. Eye setae short, only about as long as 1–2 ommatidia. Dorsum of head in lateral view slightly convex, head deepest on line through eye. Venter of head posterior to mandible convex in lateral view, with relatively sparse setae. Genal angle broadly rounded. Postgenal depression shallow, rounded. Antenna extending to posterior margin of pronotum.

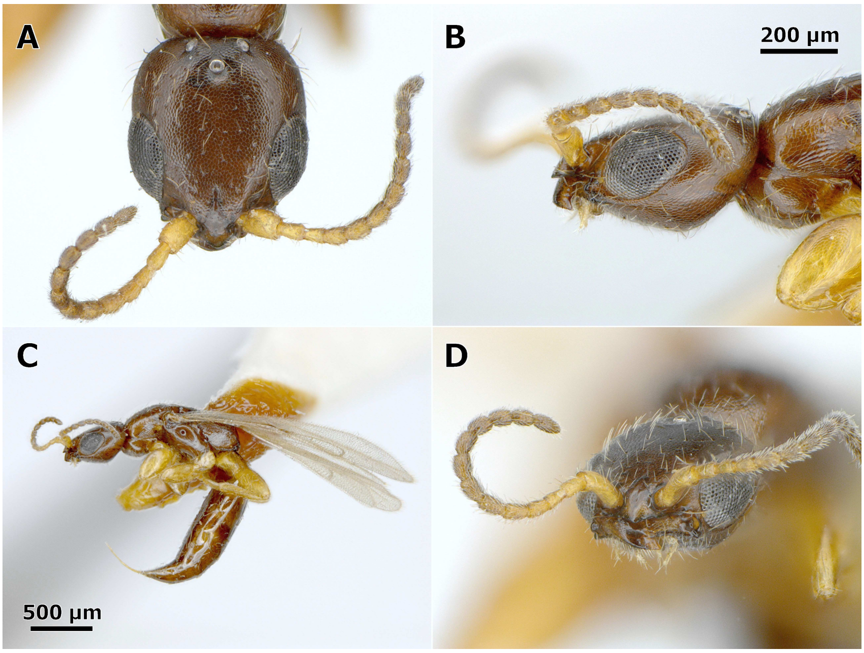


Figure 22. *Sierola graciloides*. A: head, dorsal. B: head, lateral. C: lateral habitus. D: head, frontal.

Mesosoma. Anterior margin of dorsal pronotal area in lateral view evenly rounded. Pronotal setae about as long as flagellar width or scarcely longer. Propodeal disc laterally coarsely striate; metapleural carinae complete. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with faint microsculpture laterally. Sixth sternum narrowly glabrous medially, laterally with dense pilose setae.

Color. Body entirely dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible black. Legs all yellow.

Wings. Membrane hyaline. Basal cells of fore wing densely and conspicuously setose. Cell 1M weakly convex posteriorly, corner posteroapical. Distal portion of vein Rs strongly curved, meeting anterior wing margin at oblique angle.

Measurements. LFW 2.14 mm; LM 0.98 mm; WH/LH 0.85 (0.81–0.85); DH/LH 0.57 (0.55–0.57); EV/HE 0.79 (0.79–0.83); EV/WF 0.73 (0.73–0.77); WF/HE 1.09 (1.06–1.13); WH/WF 1.75 (1.71–1.77); OOL/WOT 1.13 (1.13–1.32); DM/LM 0.39; FL/FW 2.00 (1.81–2.09); HFL/HFW 2.29 (2.22–2.29); A3 L/W 1.37 (1.11–1.37); 2R1 L/W 3.21. N = 4.

Type Material. Holotype ♀. Hawai‘i: Upper ‘Ōla‘a Forest Reserve, 4,000 ft [1,220 m], 1 Jul 1956, D.E. Hardy, BPBMENT 0000018080. Paratypes: 1♀, Kona, 2,000 ft [600 m], Sep 1892, R.C.L. Perkins, NHMUK 013380218. 1♀, Laupāhoehoe Forest Reserve, 1,219 m, fogging *Metros. polymorpha*, A6–1, GRU 4337–001, 5 Jun 1997, D.S. Gruner, BPBM. 1♀ 1♂, Upper Waiākea FR, kīpuka 6, 1,638 m, 19.6697°N 155.3583°W, canopy Malaise trap, collection K6-C-M, lot HI-1449, 20 Jul 2009, J. Riley & E. Parissenti, USNM. 1♀, Upper Waiākea FR, kīpuka 15, 1,557 m, 19.6722°N 155.3389°W, canopy Malaise trap, collection K15-C-M, lot HI-1379, 27 Jul 2009, J. Riley & E. Parissenti, USNM. 2♀, Kealakekua Ranch 3,400 ft [1,040 m], 19.5040°N 155.8624°W, beating *Pisonia brunoniana*, 16 Mar 2012, K.N. Magnacca, BPBM. 1♀, Pāpā mid road, 1,230 m, 19.2118°N 155.8169°W, Townes Malaise trap, 4 Aug 2022, K.N. Magnacca, BPBM.

Etymology. Named for its similarity to *S. gracilis* of Oahu.

Distribution. Known from nine specimens, all taken in wet forest but widely separated in time and location.

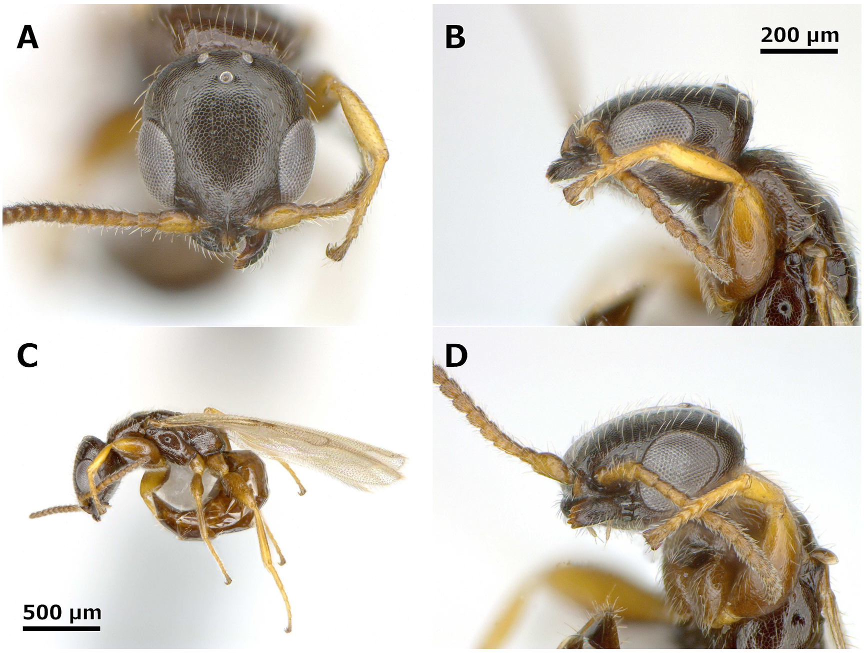


Figure 23. *Sierola gruneri*. A: head, dorsal. B: head, lateral. C: lateral habitus. D: head, frontal.

Sierola gruneri **n. sp.**

Figure 23, Map 7

Island. Hawai‘i.

Diagnosis. Belonging to the group of species with a sharp, evenly curved clypeal carina, and dense to intermediate setation of the basal wing cells. Separated from related species by the moderately broad and deep head (WH/LH ~0.91, DH/LH ~0.61), coriaceous frons microsculpture, and A3 distinctly longer than wide. Closest to *S. nemorensis* and *S. pakua* n. sp., separated from the former by having the posterior corners of the head strongly rounded off and lateral ocelli nearly touching the vertex crest, and the latter by the head dimensions. Additionally distinguished from both by the mandible, which is narrow and parallel-sided. Also close to *S. puuwaawaa*, separated by having at least two rows of setae in each of the basal wing cells, and A3 only slightly longer than wide.

Description. **Female**. *Head*. Clypeal process semicircular, apex broadly rounded; dorsally with a sharp carina; in profile evenly curved from base to apex, apical angle slightly acute. Mandible narrow, more or less parallel-sided except at base; not twisted, at most weakly convex outwardly, outwardly coriaceous, somewhat dull; in ventral view evenly, moderately curved. Apex of mandible vertical, with equally strong teeth. Malar space very small. Dorsal setae of head about as long as flagellar width or scarcely longer. Frons with distinct, uneven punctures, 1–3 pit widths apart. Vertex and gena setae similar to and only slightly longer than setae of frons. Frons microsculpture coriaceous, matte but without strong surface texture. Vertex in dorsal view more or less straight; occipital margin broadly rounded. Lateral ocelli nearly touching vertex crest. Ocellar triangle front angle weakly acute. Head rounded shortly posterior to eyes. Dorsum of head in lateral view strongly convex, head deepest on line through eye. Venter of head posterior to mandible convex in lateral view, with relatively sparse setae. Head evenly convex ventrally, genal angle absent. Postgenal depression very shallow, nearly absent. Antenna extending to mesonotum.

Mesosoma. Anterior margin of dorsal pronotal area in lateral view evenly rounded. Pronotal setae longer than flagellar width. Propodeal disc laterally shining, with weak microsculpture; metapleural carinae complete. Fore femur only moderately expanded, more than twice as long as wide, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Highly polished, without a trace of microsculpture. Sixth sternum broadly glabrous medially, with sparse setae laterally.

Color. Body entirely dark brown to black, clypeus orange to yellow. Antenna dark brown dorsally, yellowish brown ventrally. Mandible black. Coxae and femora brown, fore tibia and tarsi yellow, mid and hind tibiae brown with yellow bands at bases and apices.

Wings. Membrane hyaline. Basal cells of fore wing with intermediate setation, each with two complete rows and a few additional setae.

Measurements. LFW 1.70 mm; LM 0.78 mm; WH/LH 0.91; DH/LH 0.61; EV/HE 0.63; EV/WF 0.62; WF/HE 1.01; WH/WF 1.81; OOL/WOT 1.19; DM/LM 0.42; FL/FW 2.18; HFL/HFW 2.50; A3 L/W 1.32; 2R1 L/W 2.86.

Type Material. Holotype ♀. Hawai‘i: Kohala Forest Reserve, 1,158 m, fogging *Metros. polymorpha*, 7–2, GRU 0652–009, 14 Oct 1997, D.S. Gruner & D.A. Polhemus, BPBMENT 0000018081. Paratypes: 1♀, Upper Waiākea Forest Reserve, 1,280 m, clipping *Metros. polymorpha*, 1-A, GRU 1035–001, 25 Apr 2001, D.S. Gruner, BPBM. 1♀, Upper Waiākea FR, kīpuka 20, 1,506 m, 19.6745°N 155.3301°W, ‘ōhi‘a canopy branch clipping, collection 328, lot H.12.329, 23 Apr 2012, E.E. Wilson & D. Leopold, USNM.

Etymology. Named for the collector, Daniel S. Gruner, who obtained many of the species described here during his ‘ōhi‘a canopy fogging survey.

Distribution. Rare, known from three specimens collected in wet forest.

Discussion. This may eventually prove to be a local variant of *S. puuwaawaa* with slightly more setose wing cells, but it appears more likely to be a semi-cryptic segregate. The antennae are shorter and it occurs in wetter habitats than definitive specimens of that species. See comments under *S. puuwaawaa*.

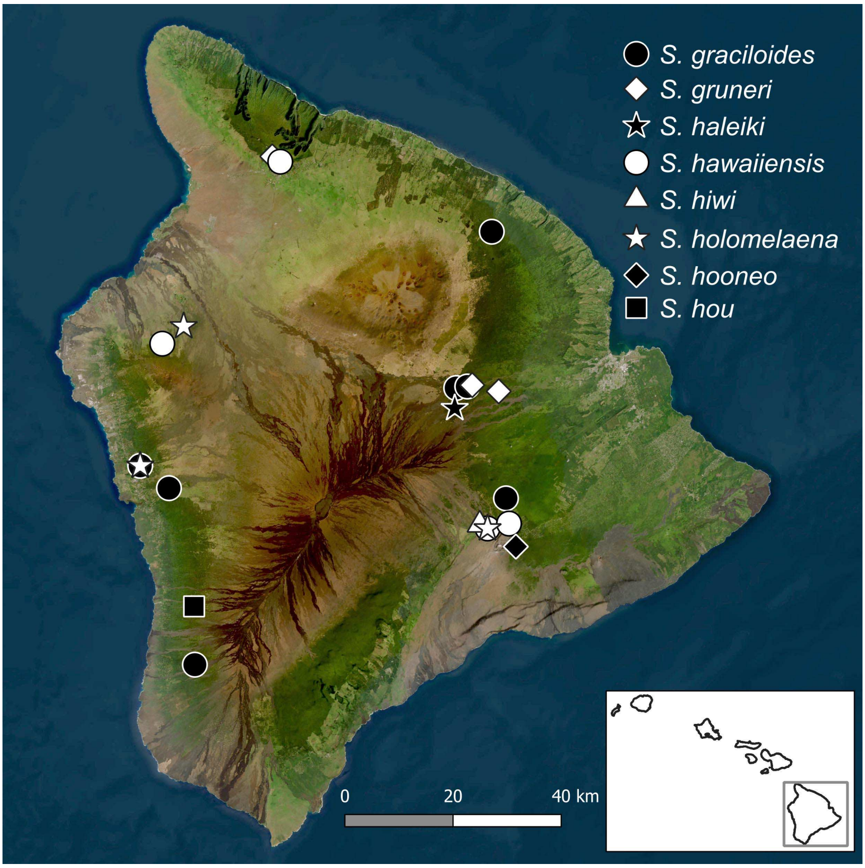
***Sierola haleiki* n. sp.**

Figure 24, Map 7

Island. Hawai‘i.

Diagnosis. Easily recognized by the clypeus with a broad, rounded ridge, densely setose basal wing cells, and ocellar triangle right to obtuse with the lateral ocelli nearly touching the vertex crest. The posterior head is unusual, with the vertex rounding evenly to the occiput in lateral view rather than forming an angle. Superficially similar to *S. ihunana* n. sp., but differing substantially in the form of the mandible (reddish brown and twisted with the ventral tooth largest) and shape of the head, which is less convex dorsally but more so ventrally, with dense ventral setation, and deeper. The clypeus is also less highly arched in profile. Nearly identical to *S. puupehu* n. sp., separated by having the head longer behind the eyes, not as deep, and not so strongly convex ventrally, overall giving a considerably different appearance.

Description. **Female**. *Head*. Clypeal process rounded triangular or trapezoidal, apex rounded; dorsally with a broad, rounded ridge; in profile evenly curved from base to apex, apical angle slightly acute. Mandible narrow, slightly expanded at base and apex, ventral margin weakly concave; strongly twisted, outwardly polished and shining distal of bend, coriaceous and dull basally; in ventral view obtusely elbowed. Apex of mandible slightly oblique, with a single large ventral tooth and a few small teeth on inner margin. Malar space very small. Dorsal setae of head about as long as flagellar width or scarcely longer. Frons with distinct, uneven punctures, 1–3 pit widths apart. Vertex and gena setae similar to and only slightly longer than setae of frons. Frons microsculpture finely microreticulate, surface weakly matte. Vertex in dorsal view more or less straight or very slightly concave; occipital margin narrowly rounded. Lateral ocelli nearly touching vertex crest. Ocellar triangle front angle weakly obtuse. Head more or less parallel-sided for some distance posterior to eyes.



Map 7. Collection localities of *Sierola graciloides, S. gruneri, S. haleiki, S. hawaiiensis, S. hiwi, S. holomelaena, S. hooneo*, and *S. hou*.

Dorsum of head in lateral view slightly convex, head deepest on line through posterior margin of eye. Venter of head posterior to mandible convex in lateral view, with moderately dense pubescence. Head evenly convex ventrally, genal angle absent. Postgenal depression very shallow, nearly absent. Antenna extending to posterior margin of pronotum.

Mesosoma. Anterior margin of dorsal pronotal area in lateral view evenly rounded. Pronotal setae longer than flagellar width. Propodeal disc laterally coarsely striate; metapleural carinae present posteriorly, fading anteriorly. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with faint microsculpture laterally. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Body entirely dark brown to black. Antenna with scape dark brown basally, yellow to orange apically, flagellum brown dorsally and yellow ventrally. Mandible black to reddish brown. Coxae and femora brown, fore tibia and tarsus and all trochanters yellow, mid and hind tibiae and tarsi brownish.

Wings. Membrane hyaline. Basal cells of fore wing densely and conspicuously setose. Cell 1M weakly convex posteriorly, corner posteroapical.

Measurements. LFW 1.78 mm; LM 0.86 mm; WH/LH 0.85; DH/LH 0.59; EV/HE 0.82; EV/WF 0.74; WF/HE 1.10; WH/WF 1.74; OOL/WOT 1.36; DM/LM 0.37; FL/FW 2.21; HFL/HFW 2.48; A3 L/W 1.17; 2R1 L/W 2.96.

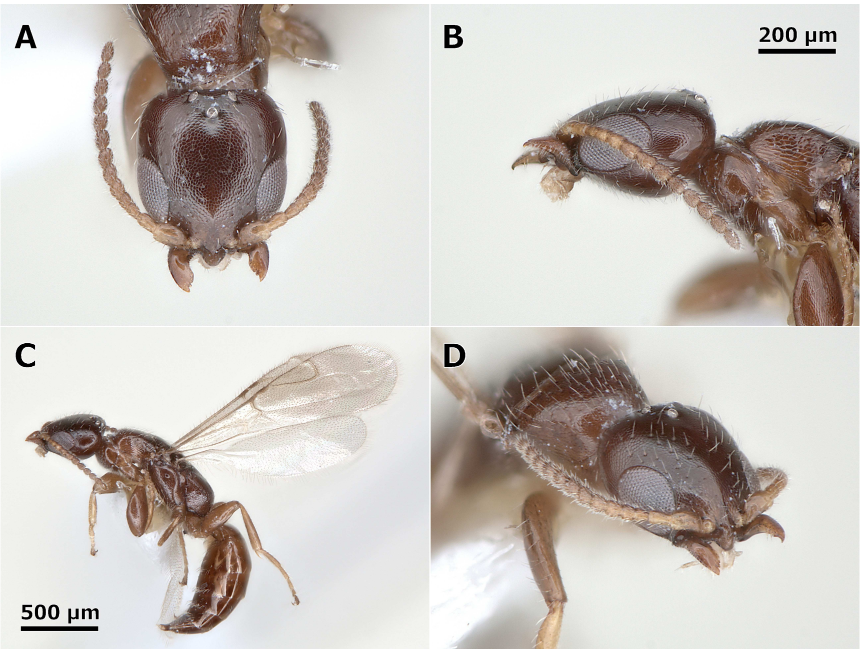


Figure 24. *Sierola haleiki*. A: head, dorsal. B: head, lateral. C: lateral habitus. D: head, frontal.

Type Material. Holotype ♀. Hawai‘i: Upper Waiākea FR, kīpuka 38, 1,731 m, canopy Malaise trap, collection K38-C-M1, lot HI-0646, 9 Apr 2009, D. Leopold, BPBMENT 0000018082.

Etymology. From the Hawaiian *hale iki*, small house, referring to the very small kīpuka where the unique holotype was collected.

Distribution. Very rare, known only from the holotype collected in a small kīpuka on windward Mauna Loa.

Discussion. This species is somewhat questionably distinct from *S. puupehu* n. sp. Each is only known from a single specimen, and it is possible that they represent the extremes of morphological variation found in a single taxon. However, I have decided to keep them separate since they not only differ in measurements but are of visibly different appearance, and together are not close to any others.

***Sierola hawaiiensis* Fullaway, 1920, n. stat.**

Figure 25, Map 7

Sierola spicata hawaiiensis Fullaway, 1920: 77.

Island. Hawai‘i.

Diagnosis. Separated from all other species on Hawai‘i by the narrow, spicate clypeus and broad head. Resembling only *S. spicata* Fullaway of O‘ahu, from which it differs in the shallowly concave vertex, short clypeus which is rounded and recurved in profile, and deeper, more convex head.

Description. **Female**. *Head*. Clypeal process narrow, rostrate, apex rounded; dorsally with a broad, rounded ridge; in profile steep and short, evenly curved. Mandible moderately broad, more or less parallel-sided except at base; not twisted, at most weakly convex outwardly, outwardly shining but with distinct, fine microsculpture; in ventral view distinctly elbowed externally, internal margin nearly straight. Apex of mandible slightly oblique, with teeth distinctly stronger ventrally. Malar space 1/3 as long as width of base of mandible. Dorsal setae of head about as long as flagellar width or scarcely longer. Frons with sparse,

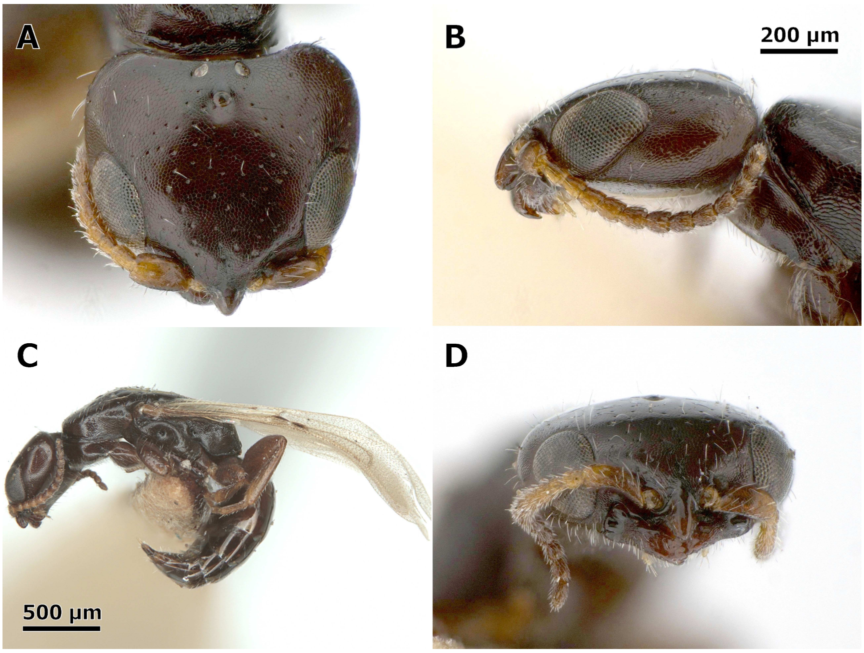


Figure 25. *Sierola hawaiiensis*. A: head, dorsal. B: head, lateral. C: lateral habitus. D: head, frontal.

scattered punctures, mostly 3 pit widths apart or more. Vertex and gena setae similar to and only slightly longer than setae of frons. Frons microsculpture evident but smooth, shining. Vertex in dorsal view broadly, shallowly concave; occipital margin carinate. Lateral ocelli nearly touching vertex crest. Ocellar triangle front angle strongly acute. Head broadening posterior to eyes. Dorsum of head in lateral view slightly convex, head deepest on line through just posterior of eye. Venter of head posterior to mandible convex in lateral view, with relatively sparse setae. Head nearly flat ventrally, genal angle absent. Postgenal depression absent. Antenna extending to anterior margin of pronotum.

Mesosoma. Anterior margin of dorsal pronotal area in lateral view evenly rounded. Pronotal setae about as long as flagellar width or scarcely longer. Propodeal disc laterally shining, with weak microsculpture; metapleural carinae complete. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with faint microsculpture laterally. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Body entirely dark brown to black. Antenna dark brown dorsally, yellowish brown ventrally. Mandible black. Coxae and femora dark brown to black, tibiae dark brown, trochanters, tarsi, and bands at bases and apices of tibiae orange.

Wings. Membrane tinged with yellow. Basal cells of fore wing sparsely setose, with one or two rows of setae in each cell.

Measurements. LFW 2.25 mm; LM 1.24 mm; WH/LH 1.01 (0.95–1.01); DH/LH 0.47 (0.44–0.48); EV/HE 0.95 (0.92–1.00); EV/WF 0.68 (0.64–0.69); WF/HE 1.40 (1.38–1.46); WH/WF 1.75 (1.69–1.77); OOL/WOT 1.94 (1.82–2.00); DM/LM 0.36; FL/FW 2.07 (2.03–2.13); HFL/HFW 2.13 (2.07–2.19); A3 L/W 1.21 (1.12–1.33); 2R1 L/W 3.18. N = 8.

Type Material. Holotype ♀. Hawai‘i: Kīlauea, 4,000 ft [1,220 m], 6 Jul 1918, W.M. Giffard, BPBMENT 0000000011.

Material examined: 5♀, Pu‘u Wa‘awa‘a, 3,700–3,800 ft [1,130–1,160 m], Aug 1917, W.M. Giffard, BPBM (paratypes). 1♀, same data, HDOA (paratype). 1♀, Kīlauea, *Pelea* (=*Melicope*), 5 Aug 1919, O.H. Swezey, BPBM. 1♀, Kamuela, 19 Jun 1964, D.E. Hardy, BPBM.

Distribution. Very rare, known from the holotype, paratype series, and one additional specimen collected at Kīlauea 1917–19, and one from Kamuela in 1964.

Discussion. This taxon was originally described as a subspecies of *S. spicata* Fullaway of O‘ahu, but differs significantly in a number of respects as listed in the diagnosis; therefore it is here raised to species level. Like its O‘ahu relative, this species is rarely seen and has not been collected for decades. The peculiar morphology suggests it may use a different habitat from most others. The paratypes were probably collected Aug. 24 along with holotypes of *S. aucta* and *S. puuwaawaa*.

Sierola hiwi n. sp.

Figure 26, Map 7

Island. Hawai‘i.

Diagnosis. Belonging to the group of species with the head and mesosoma compressed and more or less flattened, sharp clypeal carina, and basal wing cells somewhat sparsely setose. Separated from most similar species by having the vertex and gena setae elongate and ocellar triangle obtuse. Closest to *S. hooneo* n. sp.; distinguished by having the clypeus more elongate, rounded triangular, and frons more densely punctate.

Description. **Female**. *Head*. Clypeal process rounded triangular, apex rounded; dorsally with a thin, laminar carina, the sides strongly concave; in profile strongly arched, vertical or slightly recurved at apex, carina extending above antennal sockets. Mandible narrow, slightly expanded at base and apex, ventral margin weakly concave; not twisted, at most weakly convex outwardly, outwardly coriaceous, somewhat dull; in ventral view evenly, moderately curved. Apex of mandible vertical, with equally strong teeth. Malar space almost absent. Dorsal setae of head about as long as flagellar width or scarcely longer. Frons with relatively regular, moderately close punctures, 1–2 pit widths apart. Vertex and gena setae conspicuous, nearly twice as long as setae of frons and stronger, erect and directed anterior. Frons microsculpture coriaceous, matte but without strong surface texture. Vertex in dorsal view more or less straight; occipital margin narrowly rounded. Lateral ocelli nearly touching vertex crest. Ocellar triangle front angle right. Head more or less parallel-sided for some distance posterior to eyes. Dorsum of head in lateral view nearly flat posterior to middle of eyes, head deepest on line through posterior margin of eye. Venter of head posterior to mandible flat in lateral view, with relatively sparse setae. Head evenly convex ventrally, genal angle absent. Gena ventral to eye flat. Postgenal depression absent. Antenna extending to pronotum.

Mesosoma. Strongly dorsoventrally compressed. Anterior margin of dorsal pronotal area in lateral view almost evenly sloping, weakly curved, pronotal disc distinctly flattened. Pronotal setae longer than flagellar width. Propodeal disc laterally shining, with weak microsculpture; metapleural carinae nearly absent, visible only beyond propodeal declivity. Fore femur strongly expanded, less than twice as long as wide, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with faint microsculpture laterally. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Body entirely dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible yellow (?). Legs all yellow.

Wings. Membrane hyaline. Basal cells of fore wing with intermediate setation, each with two complete rows and a few additional setae. Cell 1M weakly convex posteriorly, corner posteroapical.

Measurements. LFW 1.39 mm; LM 0.70 mm; WH/LH 0.73; DH/LH 0.49; EV/HE 0.94; EV/WF 0.89; WF/HE 1.06; WH/WF 1.66; OOL/WOT 1.40; DM/LM 0.32; FL/FW 1.86; HFL/HFW 1.91; A3 L/W 0.90; 2R1 L/W 3.1.

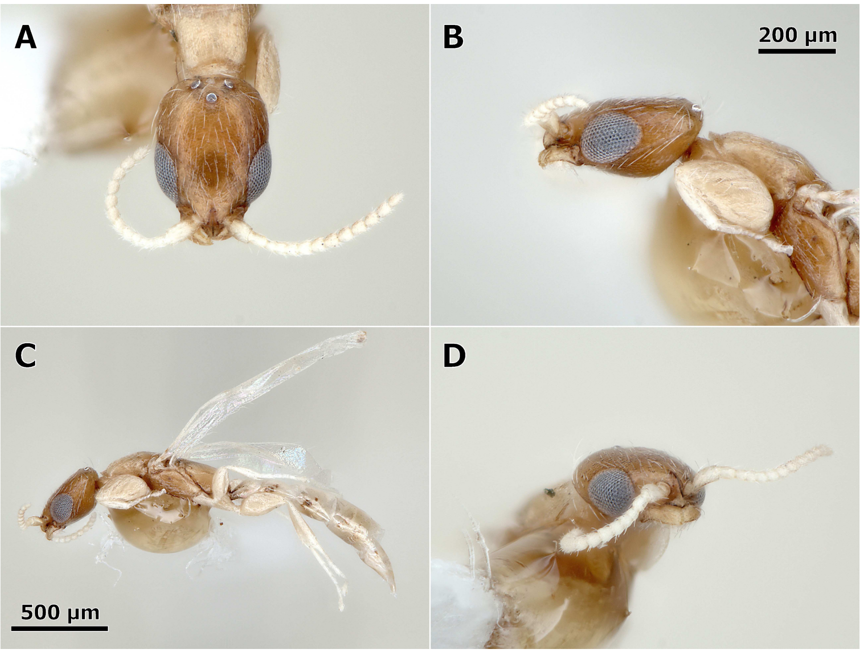


Figure 26. *Sierola hiwi*. A: head, dorsal. B: head, lateral. C: lateral habitus. D: head, frontal.

Type Material. Holotype ♀. Hawai‘i: Kīpuka Kī, yellow sticky card, 25 Feb 2005, BPBMENT 0000018083.

Etymology. From the Hawaiian *hiwi*, skinny or bony, referring to the narrow body compared to related species.

Distribution. Known only from the holotype, collected in mesic forest near Kīlauea.

Discussion. The unique holotype was stored in denatured alcohol for a long time and is heavily bleached, thus the coloration is uncertain.

Sierola holomelaena **Fullaway, 1920**

Figure 27, Map 7

Sierola holomelaena Fullaway, 1920: 147.

Island. Hawai‘i.

Diagnosis. Belonging to the group of species with the head and mesosoma compressed and more or less flattened, sharp clypeal carina, and basal wing cells sparsely setose. Close to *S. hooneo* n. sp. and *S. mealele* n. sp. in having the clypeus rounded and recurved ventrally. Separated from the former by the broader head, and weakly acute ocellar triangle, and from the latter by the broader head and fore femur.

Description. **Female**. *Head*. Clypeal process semicircular, apex rounded; dorsally with a sharp carina; in profile weakly sloping dorsally but strongly rounded and recurved at apex. Mandible moderately broad, slightly narrowed medially and expanded at apex, ventral margin weakly concave; apical half of mandible strongly convex outwardly, teeth arrayed on frontal and dorsal surfaces, outwardly coriaceous, somewhat dull; in ventral view weakly curved. Apex of mandible slightly oblique, with teeth distinctly stronger ventrally. Malar space almost absent. Dorsal setae of head about as long as flagellar width or scarcely longer. Frons with moderately close punctures between antennae and midpoint of eyes, 1–3 pit widths apart, sparse posteriorly (sometimes sparse all over). Vertex and gena setae similar

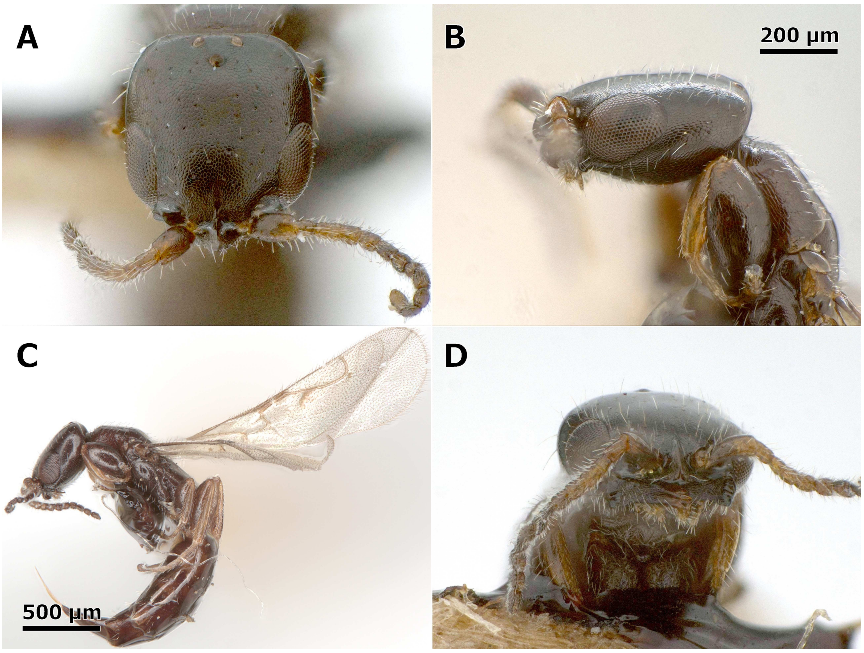


Figure 27. *Sierola holomelaena*. A: head, dorsal. B: head, lateral. C: lateral habitus. D: head, frontal.

to and only slightly longer than setae of frons. Frons microsculpture evident but smooth, shining. Vertex in dorsal view more or less straight, corners broadly rounded; occipital margin narrowly rounded. Lateral ocelli nearly touching vertex crest, or distinctly separate from vertex crest by less than ocellus length. Ocellar triangle front angle weakly acute. Head more or less parallel-sided for some distance posterior to eyes. Dorsum of head in lateral view nearly flat posterior to middle of eyes, head deepest on line through posterior margin of eye. Venter of head posterior to mandible convex in lateral view, with relatively sparse setae. Head nearly flat ventrally, genal angle absent. Postgenal depression absent. Antenna extending to pronotum.

Mesosoma. Strongly dorsoventrally compressed. Anterior margin of dorsal pronotal area in lateral view evenly rounded. Pronotal setae about as long as flagellar width or scarcely longer. Propodeal disc laterally shining, with weak microsculpture; metapleural carinae present posteriorly, fading anteriorly. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with faint microsculpture laterally. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Body entirely dark brown to black. Antenna entirely dark brown to black. Mandible black. Legs all brown.

Wings. Membrane tinged with yellow. Basal cells of fore wing sparsely setose, with one or two rows of setae in each cell.

Measurements. LFW 2.01 mm; LM 0.92 mm; WH/LH 0.85 (0.84–0.85); DH/LH 0.50 (0.48–0.50); EV/HE 0.95 (0.95–1.13); EV/WF 0.71 (0.71–0.87); WF/HE 1.33 (1.30–1.40); WH/WF 1.57 (1.57–1.69); OOL/WOT 1.92 (1.92–2.22); DM/LM 0.31; FL/FW 2.13 (2.03–2.13); HFL/HFW 2.20 (2.13–2.27); A3 L/W 1.12 (1.12–1.20). N = 5.

Type Material. Holotype ♀. Hawai‘i: Kīlauea, 4,000 ft [1,220 m], 14 Jan 1917, W.M. Giffard & F. Muir, BPBMENT 0000000149.

Material examined: 2♀, Kona, 2,000 ft [600 m], Sep 1892, R.C.L. Perkins, NHMUK 013380194.1♀, Kona, 2–3,000 ft [6–900 m], Sep 1892, R.C.L. Perkins, NHMUK 013380219. 1♀, S. Kona, *Clermontia*, 11 Aug 1919, O.H. Swezey, BPBM. 1♀, Pu‘u Wa‘awa‘a cone, 3,700 ft [1,130 m], 19.7716°N 155.8365°W, sweeping, 9 May 2012, K.N. Magnacca, KNMC.

Distribution. Very rare; known from only five specimens, the holotype from Kīlauea and the rest from Kona.

Discussion. The holotype is on the extreme end of most head measurements, possibly due to being a small specimen. The recent collections of the similar *S. hooneo* n. sp., *S. mealele* n. sp., and *S. molina* n. sp. in the vicinity of Kīlauea suggests that perhaps these could all represent one very variable species, but if so this would be well beyond the range of both structural and morphometric variation seen in other species. Therefore, I prefer to split them until more evidence is available.

***Sierola hooneo* n. sp.**

Figure 28, Map 7

Island. Hawai‘i.

Diagnosis. Belonging to the group of species with the head and mesosoma compressed and more or less flattened, sharp clypeal carina, and basal wing cells somewhat sparsely setose. Similar to *S. holomelaena* Fullaway and *S. mealele* n. sp. in having the clypeus rounded and recurved ventrally. Separated from both by the strongly obtuse ocellar triangle and smaller OOL/WOT; additionally separated from the former by the narrow head, and from the latter by the broader fore femur. Closest to *S. hiwi* n. sp. in having the vertex and gena setae elongate and ocellar triangle obtuse; separated by having the clypeus rather short and semi-elliptical and frons sparsely punctate.

Description. **Female**. *Head*. Clypeal process semi-elliptical, apex rounded; dorsally with a thin, laminar carina, the sides strongly concave; in profile evenly curved from base to apex, apical angle slightly acute. Mandible moderately narrow, slightly narrowed medially from base, ventral margin weakly concave; not twisted, at most weakly convex outwardly, outwardly coriaceous, somewhat dull; in ventral view evenly, moderately curved. Apex of mandible slightly oblique, with teeth distinctly stronger ventrally. Malar space almost absent. Dorsal setae of head distinctly longer than flagellar width. Frons with sparse, scattered punctures, mostly 3 pit widths apart or more. Vertex and gena setae conspicuous, nearly twice as long as setae of frons and stronger, erect and directed anterior. Frons microsculpture evident but smooth, shining. Vertex in dorsal view more or less straight, corners strongly rounded off; occipital margin narrowly rounded. Lateral ocelli nearly touching vertex crest. Ocellar triangle front angle weakly obtuse. Head rounded shortly posterior to eyes. Dorsum of head in lateral view nearly flat posterior to middle of eyes, head deepest on line through posterior margin of eye. Venter of head posterior to mandible convex in lateral view, with relatively sparse setae. Head nearly flat ventrally, genal angle absent. Postgenal depression absent. Antenna extending to anterior margin of pronotum.

Mesosoma. Strongly dorsoventrally compressed. Anterior margin of dorsal pronotal area in lateral view evenly rounded, pronotal disc distinctly flattened. Pronotal setae elongate, twice as long as flagellar width or more. Propodeal disc laterally finely, weakly striate; metapleural carinae nearly absent, visible only beyond propodeal declivity. Fore femur strongly expanded, less than twice as long as wide, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with faint microsculpture laterally. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Body entirely dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible black. Legs all brown.

Wings. Membrane tinged with yellow. Basal cells of fore wing with intermediate setation, each with two complete rows and a few additional setae. Cell 1M weakly convex posteriorly, corner posteroapical.

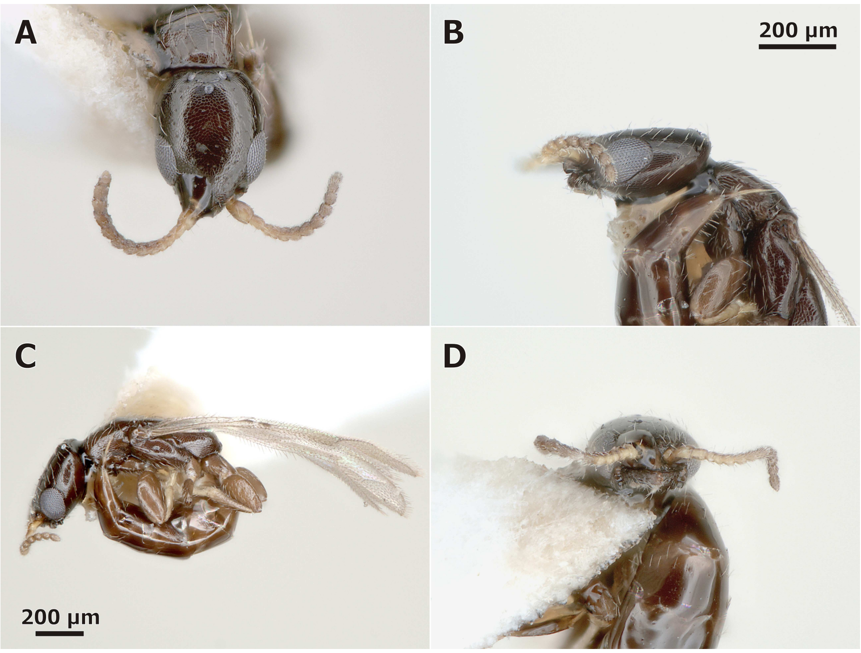


Figure 28. *Sierola hooneo*. A: head, dorsal. B: head, lateral. C: lateral habitus. D: head, frontal.

Measurements. LFW 1.29 mm; LM 0.60 mm; WH/LH 0.76; DH/LH 0.46; EV/HE 1.10; EV/WF 0.90; WF/HE 1.22; WH/WF 1.61; OOL/WOT 1.49; DM/LM 0.32; FL/FW 1.80; HFL/HFW 1.91; A3 L/W 0.83; 2R1 L/W 3.63.

Type Material. Holotype ♀. Hawai‘i: Hawaii Volcanoes National Park, 1,138 m, 14 Jul 2016, M.S. Hoddle, BPBMENT 0000018084.

Etymology. From the Hawaiian *ho‘oneo*, to devastate or lay waste, referring to the collection of the holotype from the Devastation Trail area near the cinderfall of the 1959 Kīlauea Iki eruption.

Distribution. Known only from the holotype, collected in 2016 at Kīlauea.

***Sierola hou* n. sp.**

Figure 29, Map 7

Island. Hawai‘i.

Diagnosis. A very distinctive species, easily recognizable by the entirely scutellate microsculpture of the frons which obscures the punctation. Very similar to *S. okala* n. sp., which has the unusual microsculpture colliculate (each cellule strongly convex rather than flat) and found only below the middle of the eyes, above this with smooth, rather fine sculpting that reveals the punctation. The two species are similar in head dimensions but distinctly different in overall appearance – *S. hou* has the head more strongly convex dorsally and ventrally, and the posterior corners more rounded.

Description. **Female**. *Head*. Clypeal process semi-elliptical, apex rounded; dorsally with a sharp carina, or weakly carinate; in profile evenly curved from base to apex, apical angle slightly acute. Mandible moderately narrow, slightly narrowed medially from base, ventral margin weakly concave; not twisted, at most weakly convex outwardly, outwardly coriaceous, somewhat dull; in ventral view weakly curved. Apex of mandible vertical, with teeth distinctly stronger ventrally. Malar space almost absent. Dorsal setae of head about as long as flagellar width or scarcely longer. Frons punctation obscured by microsculpture.

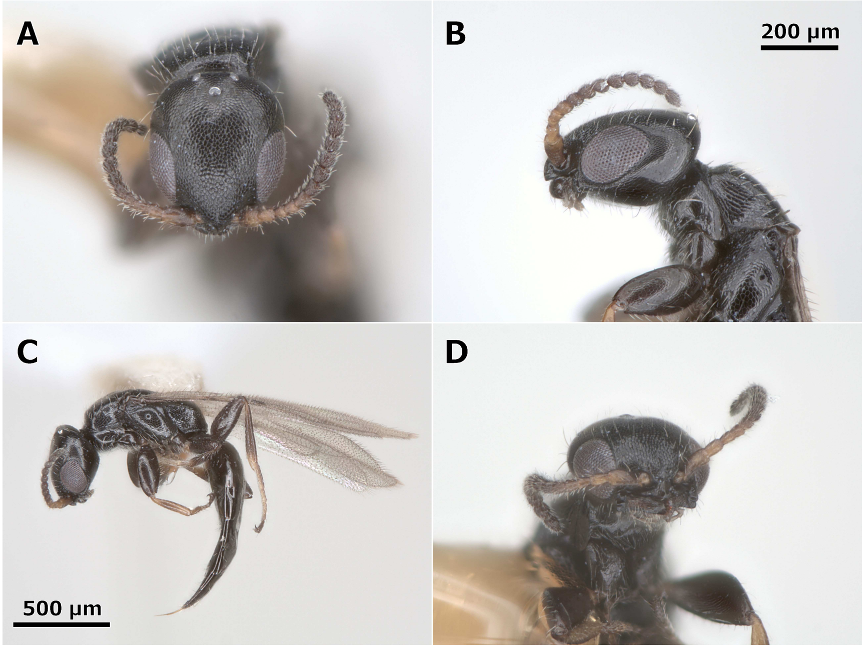


Figure 29. *Sierola hou*. A: head, dorsal. B: head, lateral. C: lateral habitus. D: head, frontal.

Vertex and gena setae distinctly longer than frons setae but only about as thick, not particularly conspicuous. Frons microsculpture minutely scutellate, cellules shining but separated by conspicuous margins. Vertex in dorsal view more or less straight, corners strongly rounded off; occipital margin broadly rounded. Lateral ocelli nearly touching vertex crest. Ocellar triangle front angle weakly obtuse. Head more or less parallel-sided for some distance posterior to eyes. Dorsum of head in lateral view strongly convex, head deepest on line through eye. Venter of head posterior to mandible convex in lateral view, with relatively sparse setae. Head strongly convex ventrally, genal angle absent. Postgenal depression absent. Antenna extending to posterior margin of pronotum.

Mesosoma. Anterior margin of dorsal pronotal area in lateral view weakly angulate. Pronotal setae longer than flagellar width. Propodeal disc laterally shining, with weak microsculpture; metapleural carinae complete. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Highly polished, without a trace of microsculpture. Sixth sternum broadly glabrous medially, with moderately dense setae laterally.

Color. Body entirely dark brown to black. Antenna entirely dark brown except ventral side of basal segments yellowish. Mandible black. Coxae and femora dark brown to black, fore tibia and tarsi yellow, mid and hind tibiae brown with yellow bands at bases and apices.

Wings. Membrane hyaline. Basal cells of fore wing with intermediate setation, each with two complete rows and a few additional setae. Cell 1M weakly convex posteriorly, corner posteroapical.

Measurements. LFW 1.58 mm; LM 0.69 mm; WH/LH 0.84; DH/LH 0.59; EV/HE 0.69; EV/WF 0.67; WF/HE 1.03; WH/WF 1.73; OOL/WOT 1.26; DM/LM 0.40; FL/FW 2.11; HFL/HFW 2.69; A3 L/W 1.09; 2R1 L/W 3.07.

Type Material. Holotype ♀. Hawaiʻi: Kukuiopaʻe upper, 1,390 m, on *Metrosideros polymorpha*, 8 Aug 2022, K.N. Magnacca, BPBMENT 0000018085.

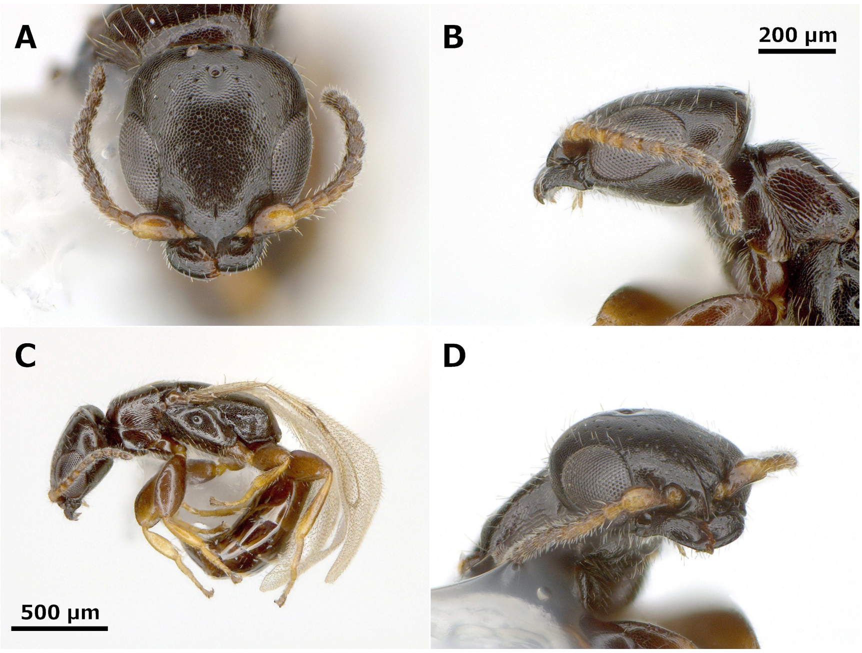


Figure 30. *Sierola huinakolu*. A: head, dorsal. B: head, lateral. C: lateral habitus. D: head, frontal.

Etymology. From the Hawaiian *hou*, new or recent, referring to the collection of the holotype late in preparation of this manuscript.

Distribution. Known only from the holotype, collected in South Kona.

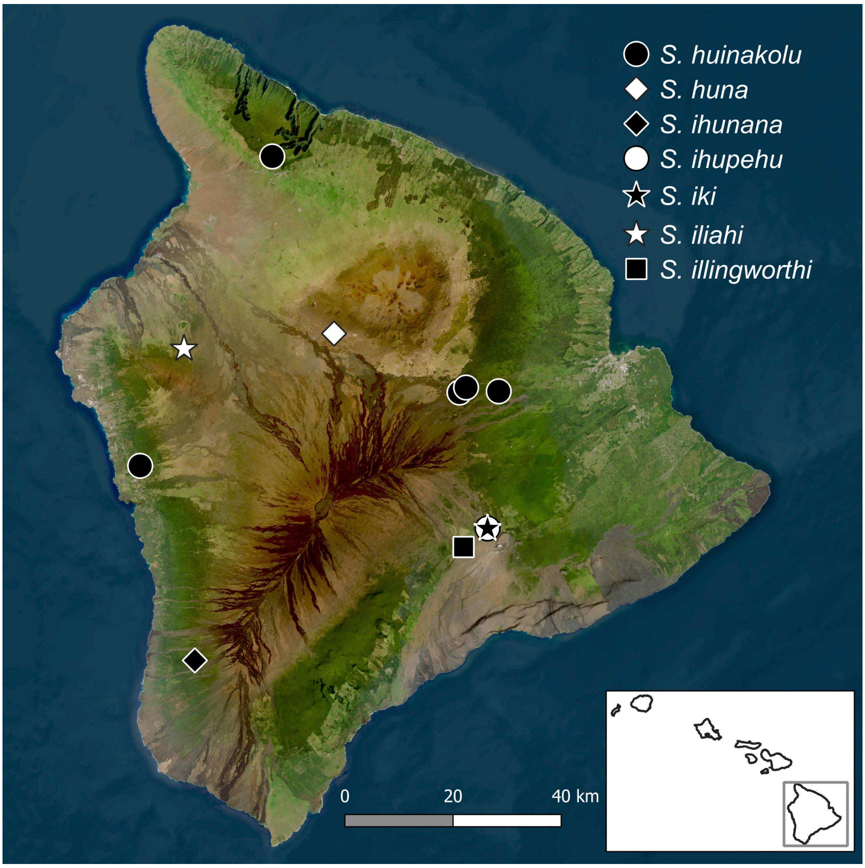
Sierola huinakolu n. sp.

Figure 30, Map 8

Island. Hawai‘i.

Diagnosis. Distinguished by having the clypeus weakly carinate, mandible black and moderately narrow, ocelli nearly touching the vertex crest, and head evenly convex ventrally, without a strong genal angle. Most similar to *S. ahulu* n. sp. but quite distinct in general habitus, with the head rounded posteriorly and more compressed, and clypeus evenly curved.

Description. **Female**. *Head*. Clypeal process rounded triangular, apex weakly pointed; dorsally weakly carinate; in profile evenly curved from base to apex, apical angle slightly acute. Mandible moderately narrow, narrowed medially from base, ventral margin weakly to distinctly concave; slightly twisted, outwardly coriaceous, somewhat dull; in ventral view distinctly elbowed externally, internal margin nearly straight. Apex of mandible vertical, with equally strong teeth. Malar space 1/4 as long as width of base of mandible. Dorsal setae of head about as long as flagellar width or scarcely longer. Frons with distinct, uneven punctures, 1–3 pit widths apart. Vertex and gena setae similar to and only slightly longer than setae of frons. Frons microsculpture finely microreticulate, surface weakly matte. Vertex in dorsal view more or less straight; occipital margin narrowly rounded. Lateral ocelli nearly touching vertex crest. Ocellar triangle front angle right. Head more or less parallel-sided for some distance posterior to eyes. Dorsum of head in lateral view slightly convex, head deepest on line through posterior margin of eye. Venter of head posterior to mandible flat in lateral view, with relatively sparse setae. Head evenly convex ventrally, genal angle



Map 8. Collection localities of *Sierola huinakolu, S. huna, S. ihunana, S. ihupehu, S. iki, S. iliahi*, and *S. illingworthi*.

absent. Postgenal depression very shallow, nearly absent. Antenna extending to anterior margin of pronotum.

Mesosoma. Anterior margin of dorsal pronotal area in lateral view weakly angulate. Pronotal setae about as long as flagellar width or scarcely longer. Propodeal disc laterally finely, weakly striate; metapleural carinae present posteriorly, fading anteriorly. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Highly polished, without a trace of microsculpture. Sixth sternum broadly glabrous medially, with sparse setae laterally.

Color. Body entirely dark brown to black. Antenna entirely dark brown except ventral side of basal segments yellowish. Mandible black. Coxae and femora dark brown to black, fore tibia and tarsi yellow, mid and hind tibiae brown with yellow bands at bases and apices.

Wings. Membrane tinged with yellow. Basal cells of fore wing with intermediate setation, each with two complete rows and a few additional setae.

Measurements. LFW 1.78 mm; LM 0.93 mm; WH/LH 0.90 (0.88–0.90); DH/LH 0.56 (0.53–0.56); EV/HE 0.61 (0.61–0.63); EV/WF 0.59 (0.57–0.59); WF/HE 1.04 (1.04–1.11); WH/WF 1.77 (1.67–1.77); OOL/WOT 1.19 (1.19–1.31); DM/LM 0.37; FL/FW 1.96 (1.93–1.97); HFL/HFW 2.17 (2.09–2.22); A3 L/W 1.00; 2R1 L/W 2.94. N = 3.

Type Material. Holotype ♀. Hawai‘i: Upper Waiākea Forest Reserve, 1,280 m, clipping *Metros. polymorpha*, 5-B, GRU 7151–002, 18 Apr 2001, D.S. Gruner, BPBMENT 0000018086. Paratypes: 1♀, Kona, 2,000 ft [600 m], Sep 1892, R.C.L. Perkins, NHMUK 013380247. 1♀, Kohala Forest Reserve, 1,158 m, fogging *Metros. polymorpha*, 11–2, GRU 0775–006, 14 Oct 1997, D.S. Gruner & D.A. Polhemus, BPBM. 1♀, Upper Waiākea FR, kīpuka 23, 1659 m, 19.6621°N 155.3525°W, ‘ōhi‘a canopy branch clipping, collection K23-TR1–2009, lot HI-1079, 12 Aug 2009, D. Leopold & B. Hwang, USNM. 1♀, Upper Waiākea FR, kīpuka 13, 1,585 m, 19.6705°N 155.3409°W, canopy Malaise trap, collection K13-C-M, lot HI-1301, 24 Aug 2009, J. Riley & E. Parissenti, BPBM.

Etymology. From the Hawaiian *huinakolu*, triangle, referring to the specimens coming from widely separated areas of the island marking out a triangle.

Distribution. Known from only five specimens, one collected by Perkins in Kona and four recent from Kohala and Upper Waiakea.

***Sierola huna* n. sp.**

Figure 31, Map 8

Island. Hawai‘i.

Diagnosis. Easily recognized by the broad head which is widest behind the eyes and narrowest near the anterior margin of eyes, clypeus recurved in profile, and moderately broad mandible which is usually reddish brown. Very similar to *S. wahaula* n. sp., differing in having short frons setae (hardly as long as flagellum width) and the mandible distinctly expanded toward the apex.

Description. **Female**. *Head*. Clypeal process semi-elliptical, apex broadly rounded; dorsally with a rounded carina; in profile weakly sloping dorsally but strongly rounded and recurved at apex. Mandible moderately broad, distinctly narrowed medially and expanded at apex, ventral margin concave (distinctly wider at apex than base); not twisted, at most weakly convex outwardly, outwardly coriaceous, somewhat dull; in ventral view evenly, moderately curved. Apex of mandible vertical, with teeth distinctly stronger ventrally. Malar space very small. Dorsal setae of head about as long as flagellar width or scarcely longer. Frons with sparse, scattered punctures, mostly 3 pit widths apart or more. Vertex and gena setae similar to and only slightly longer than setae of frons. Frons microsculpture evident but smooth, shining. Vertex in dorsal view very slightly concave; occipital margin broadly rounded. Lateral ocelli distinctly separate from vertex crest by less than ocellus length. Ocellar triangle front angle weakly to strongly acute. Head broadening posterior to eyes. Dorsum of head in lateral view slightly convex, head deepest on line through posterior margin of eye. Venter of head posterior to mandible convex in lateral view, with relatively sparse setae. Head weakly convex ventrally, genal angle absent. Postgenal depression very shallow, nearly absent. Antenna extending to anterior margin of pronotum.

Mesosoma. Anterior margin of dorsal pronotal area in lateral view evenly rounded. Pronotal setae about as long as flagellar width or scarcely longer. Propodeal disc laterally shining, with weak microsculpture; metapleural carinae present posteriorly, fading anteriorly. Fore femur only moderately expanded, more than twice as long as wide, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with faint microsculpture laterally. Sixth sternum narrowly glabrous medially, laterally with dense pilose setae.

Color. Body entirely dark brown to black. Antenna brown on base of scape and apical flagellar segments, yellow medially. Mandible reddish brown. Coxae and femora brown, tibiae, tarsi, and trochanters yellow.

Wings. Membrane hyaline. Basal cells of fore wing sparsely setose, cell R somewhat densely setose apically. Cell 1M weakly convex posteriorly, corner posteroapical.

Measurements. LFW 2.03 mm; LM 1.05 mm; WH/LH 0.89; DH/LH 0.55; EV/HE 1.08; EV/WF 0.78; WF/HE 1.39; WH/WF 1.68; OOL/WOT 1.75; DM/LM 0.39; FL/FW 2.50; HFL/HFW 2.42; A3 L/W 1.10; 2R1 L/W 2.5.

Type Material. Holotype ♀. Hawai‘i: Pōhakuloa, 1,800 m, 21 Jun 1966, J.W. Beardsley, BPBMENT 0000018087.

Etymology. From the Hawaiian *hūnā*, hidden, referring to the one known specimen among numerous of the similar *S. wahaula*.

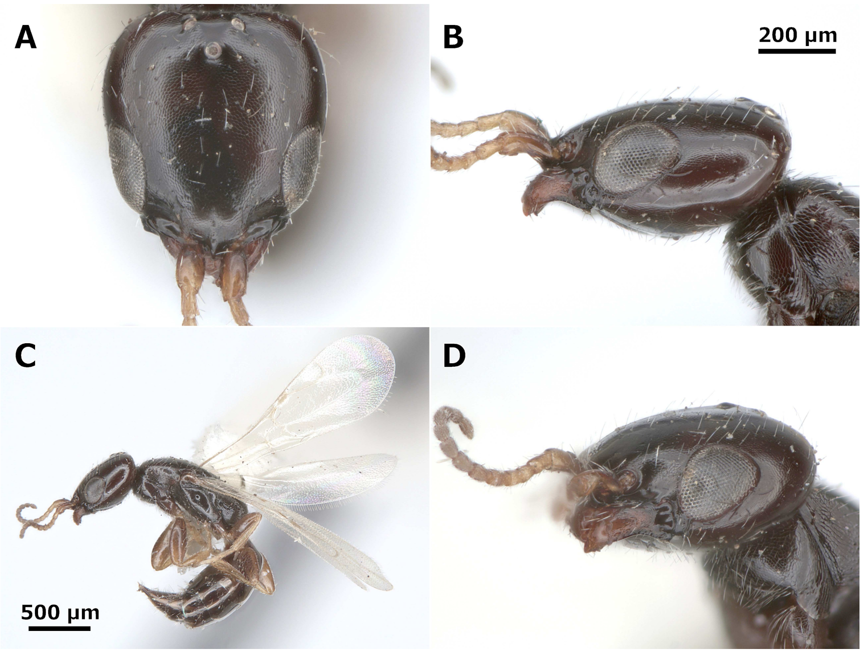


Figure 31. *Sierola huna*. A: head, dorsal. B: head, lateral. C: lateral habitus. D: head, frontal.

Distribution. Known only from the holotype, collected in 1966 at Pōhakuloa.

Discussion. Like its sister taxon *S. wahaula*, this species is readily distinguished despite coming out in multiple places in the key (see notes under that species). It could possibly be a mutant form of *S. wahaula*, but I have chosen to describe it as distinct since it exhibits characters that reliably separate other species. Many morphometric measurements overlap with *S. wahaula* but are at the extreme of its range or slightly beyond: the head is relatively narrow, deep, and long behind the eyes. The fore femur is also extremely narrow, and combining all these specimens in one taxon would be beyond variation seen in any other species.

***Sierola ihunana* n. sp.**

Figure 32, Map 8

Island. Hawai‘i.

Diagnosis. Easily recognized by the clypeus with a broad, rounded ridge, densely setose basal wing cells, and ocellar triangle right to obtuse with the lateral ocelli nearly touching the vertex crest. Very close to *S. puupehu* n. sp., differing in the form of the mandible (black and convex outwardly with the second ventral tooth largest) and shape of the head, which is more convex dorsally but less so ventrally, with sparse ventral setation, and not so deep. The clypeus is also more strongly arched in profile.

Description. **Female**. *Head*. Clypeal process semicircular, apex rounded; dorsally with a broad, rounded ridge; in profile evenly curved from base to apex, apical angle slightly acute. Mandible narrow, slightly expanded at base and apex, ventral margin weakly concave; apical half of mandible strongly convex outwardly, teeth arrayed on frontal and dorsal surfaces, outwardly shining but with distinct, fine microsculpture; in ventral view evenly, moderately curved. Apex of mandible vertical, with second ventral tooth largest. Malar space very small. Dorsal setae of head about as long as flagellar width or scarcely longer. Frons with shallow, uneven punctures, 1–3 pit widths apart. Vertex and gena setae similar to and only slightly longer than setae of frons. Frons microsculpture coriaceous, matte but without

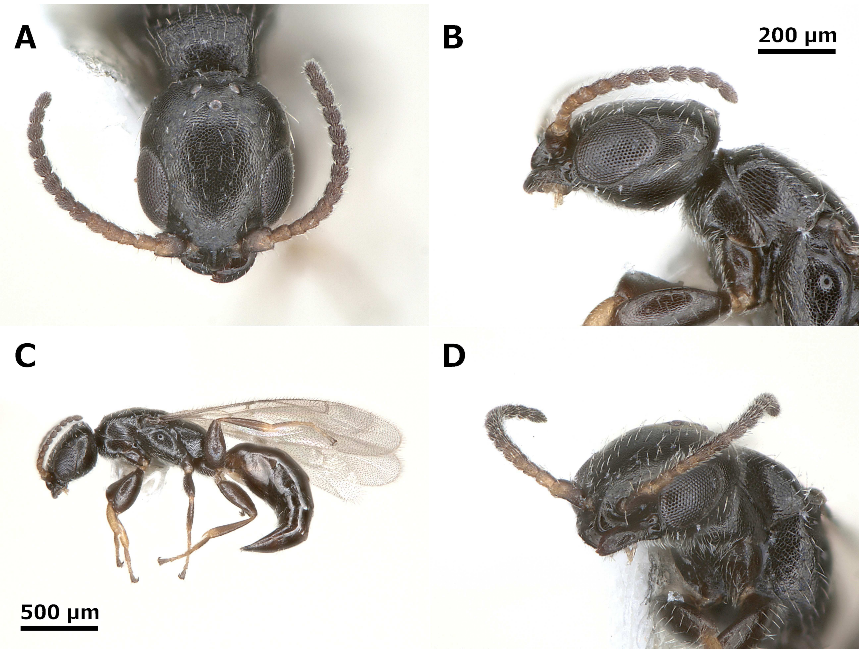


Figure 32. *Sierola ihunana*. A: head, dorsal. B: head, lateral. C: lateral habitus. D: head, frontal.

strong surface texture. Vertex in dorsal view more or less straight, corners strongly rounded off; occipital margin broadly rounded. Lateral ocelli nearly touching vertex crest. Ocellar triangle front angle right. Head rounded shortly posterior to eyes. Dorsum of head in lateral view slightly convex, head deepest on line through posterior margin of eye. Venter of head posterior to mandible convex in lateral view, with relatively sparse setae. Head evenly convex ventrally, genal angle absent. Postgenal depression very shallow, nearly absent. Antenna extending to posterior margin of pronotum.

Mesosoma. Anterior margin of dorsal pronotal area in lateral view evenly rounded. Pronotal setae about as long as flagellar width or scarcely longer. Propodeal disc laterally finely, weakly striate; metapleural carinae complete. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with faint microsculpture laterally. Sixth sternum broadly glabrous medially, with moderately dense setae laterally.

Color. Body entirely dark brown to black. Antenna entirely dark brown except ventral side of basal segments yellowish. Mandible black. Coxae, trochanters, and femora dark brown, fore tibia and tarsi yellow, mid and hind tibiae brown with yellow bands at bases and apices.

Wings. Membrane hyaline. Basal cells of fore wing densely and conspicuously setose. Cell 1M weakly convex posteriorly, corner posteroapical.

Measurements. LFW 1.76 mm; LM 0.82 mm; WH/LH 0.83 (0.82–0.84); DH/LH 0.58 (0.58–0.59); EV/HE 0.73 (0.73–0.76); EV/WF 0.70 (0.70–0.71); WF/HE 1.05 (1.05–1.09); WH/WF 1.73 (1.71–1.73); OOL/WOT 1.27 (1.21–1.35); DM/LM 0.41; FL/FW 2.03 (1.97–2.09); HFL/HFW 2.29 (2.29–2.42); A3 L/W 1.08 (1.08–1.16); 2R1 L/W 3. N = 3.

Type Material. Holotype ♀. Hawai‘i: Pāpā mid road, 1230 m, Townes Malaise trap, H22080401–02, 1 Jul–4 Aug 2022, K.N. Magnacca, BPBMENT 0000018088. Paratypes: 2♀, same data as holotype, BPBM.

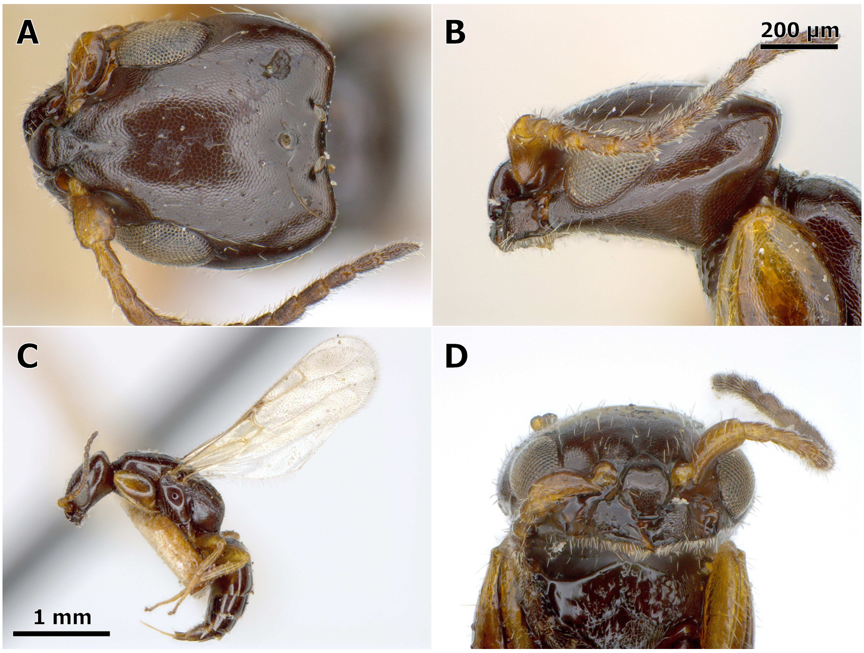


Figure 33. *Sierola ihupehu*. A: head, dorsal. B: head, lateral. C: lateral habitus. D: head, frontal.

Etymology. From the Hawaiian *ihu nanā*, snarling nose, referring to the raised and rounded clypeus.

Distribution. Known from three recent specimens collected together in South Kona.

***Sierola ihupehu* n. sp.**

Figure 33, Map 8

Island. Hawaiʻi.

Diagnosis. Easily recognized by the flat, spatulate, somewhat bulbous clypeus. The head is large, convex above and flat or slightly concave below, vertex distinctly angulate, and mandible with a single large ventral tooth and the other teeth small. Nearly identical to *S. pili*, differing in the shape of the head and curvature of the clypeus: head broader (WH/LH 0.82) and strongly curved dorsally; vertex shallowly but broadly concave in dorsal view; clypeus more bulbous, distinctly raised above the slope of the front of the head; and apex of clypeus broadly transverse.

Description. **Female**. *Head*. Clypeal process spatulate, expanded beyond anterior margin of head, apex truncate; dorsally flat, not carinate, slightly convex only laterally; in profile steep and short, evenly curved. Mandible moderately broad, more or less parallel-sided except at base; strongly twisted, outwardly shining but with distinct, fine microsculpture; in ventral view distinctly elbowed externally, internal margin nearly straight. Apex of mandible strongly oblique, with a single large ventral tooth and a few small teeth on inner margin. Malar space 1/3 as long as width of base of mandible. Dorsal setae of head shorter than flagellar width. Frons with sparse, scattered punctures, mostly 3 pit widths apart or more. Vertex and gena setae similar to and only slightly longer than setae of frons. Frons microsculpture evident but smooth, shining. Vertex in dorsal view broadly, shallowly concave; occipital margin not carinate but forming a pronounced ridge. Lateral ocelli nearly touching vertex crest. Ocellar triangle front angle strongly acute. Head broadening posterior to eyes. Dorsum of head in lateral view strongly convex, head deepest on line well posterior of eye. Venter of head posterior to mandible concave in lateral view, with relatively sparse setae. Genal angle prominent, apex rounded, head distinctly triangular in lateral view. Gena ventral to eye flat. Postgenal depression deep, distinct, broad. Antenna extending to mesonotum.

Mesosoma. Pronotal setae short, inconspicuous. Propodeal disc laterally coarsely striate; metapleural carinae present posteriorly, fading anteriorly. Fore femur strongly expanded, less than twice as long as wide, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with very faint microreticulation over posterior terga. Sixth sternum narrowly glabrous medially, laterally with dense pilose setae.

Color. Body entirely dark brown to black. Antenna entirely dark brown to black. Mandible black. Coxae and femora brown, tibiae, tarsi, and trochanters brownish orange.

Wings. Membrane hyaline. Basal cells of fore wing nearly glabrous, with only few scattered setae. Cell 1M weakly convex posteriorly, corner posteroapical.

Measurements. LFW 1.94 mm; LM 1.14 mm; WH/LH 0.82; DH/LH 0.52; EV/HE 1.10; EV/WF 0.78; WF/HE 1.41; WH/WF 1.67; OOL/WOT 1.83; DM/LM 0.40; FL/FW 1.84; HFL/HFW 2.40; A3 L/W 1.33; 2R1 L/W 3.27.

Type Material. Holotype ♀. Hawai‘i: Kīlauea, 4,000 ft [1,220 m], Oct 1915, W.M. Giffard, BPBMENT 0000018089. Paratype: 1♀, Kīlauea, 4,000 ft [1,220 m], 12 Jan 1917, F. Muir, BPBM.

Etymology. From the Hawaiian *ihu pehu*, swollen nose, referring to the enlarged, bent-down clypeus.

Distribution. Known only from two specimens collected at Kīlauea in 1915 and 1917, both originally designated as paratypes of *S. distincta*.

***Sierola iki* n. sp.**

Figure 34, Map 8

Island. Hawai‘i.

Diagnosis. Belonging to the group of species with a sharp clypeal carina and sparse to intermediate setation of the basal wing cells. Separated from most others by the relatively narrow head and moderately narrow, black mandible. Very similar to *S. minuta* Fullaway, distinguished by having the head flatter below, mandible not convex outwardly, clypeus recurved in profile, and basal wing cells with more than one row of setae. Closest to *S. puakii* n. sp., separated by having the vertex straight in dorsal view, lateral ocelli nearly touching the vertex crest, and head slightly broader, WH/LH 0.79–0.81 vs. ~0.73. Both are also similar to *S. maiki* n. sp., which has the head shorter behind the eyes and the posterior corners strongly rounded.

Description. **Female**. *Head*. Clypeal process semi-elliptical, apex broadly rounded; dorsally with a sharp carina; in profile weakly sloping dorsally but strongly rounded and recurved at apex. Mandible moderately narrow, slightly narrowed medially from base, ventral margin weakly concave; not twisted, at most weakly convex outwardly, outwardly coriaceous, somewhat dull; in ventral view evenly, moderately curved. Apex of mandible vertical, with equally strong teeth. Malar space almost absent. Dorsal setae of head shorter than flagellar width. Frons with sparse, scattered punctures, mostly 3 pit widths apart or more, or moderately punctate, about 2–3 pit widths apart. Vertex and gena setae similar to and only slightly longer than setae of frons. Frons microsculpture finely microreticulate, surface weakly matte, or coriaceous, matte but without strong surface texture. Vertex in dorsal view more or less straight; occipital margin narrowly rounded. Lateral ocelli nearly touching vertex crest. Ocellar triangle front angle weakly acute. Head more or less parallel-sided for some distance posterior to eyes. Dorsum of head in lateral view slightly convex, head deepest on line through posterior margin of eye. Venter of head posterior to mandible convex in lateral view, with moderately dense pubescence. Head weakly convex to nearly flat ventrally, genal angle absent. Postgenal depression absent. Antenna extending to pronotum.

Mesosoma. Anterior margin of dorsal pronotal area in lateral view evenly rounded. Pronotal setae about as long as flagellar width or scarcely longer. Metapleural carinae present posteriorly, fading anteriorly. Fore femur only moderately expanded, more than twice as long as wide, strongly laterally compressed, slightly arcuate in dorsal view.

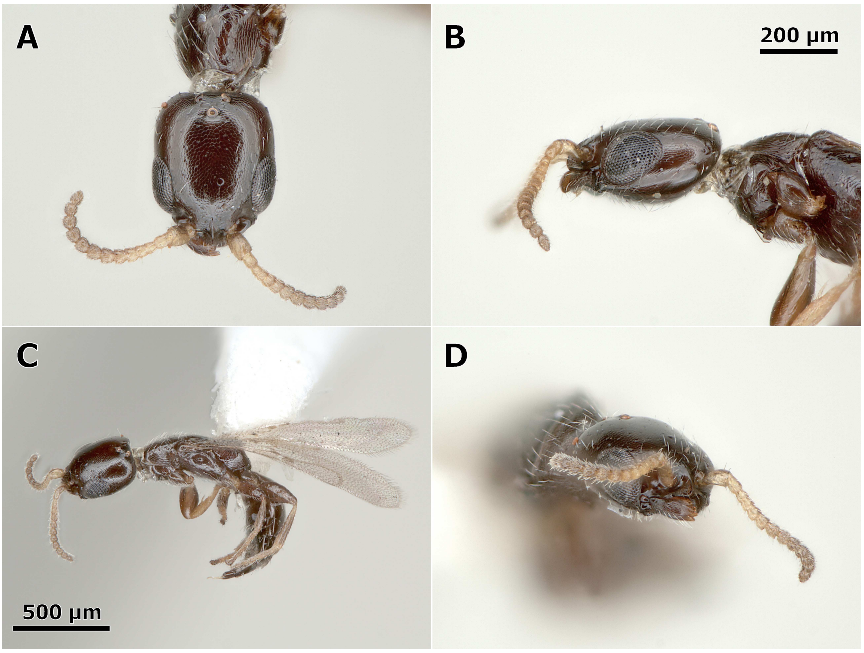


Figure 34. *Sierola iki*. A: head, dorsal. B: head, lateral. C: lateral habitus. D: head, frontal.

Metasoma. Shining, with faint microsculpture laterally. Sixth sternum broadly glabrous medially, with moderately dense setae laterally.

Color. Body entirely dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible black. Coxae, trochanters, and femora dark brown, tibiae brown, tarsi yellow.

Wings. Membrane hyaline. Basal cells of fore wing with intermediate setation, each with two complete rows and a few additional setae. Cell 1M weakly convex posteriorly, corner posteroapical.

Measurements. LFW 1.27 mm; LM 0.61 mm; WH/LH 0.81; DH/LH 0.55; EV/HE 0.94; EV/WF 0.78; WF/HE 1.21; WH/WF 1.62; OOL/WOT 1.60; DM/LM 0.37; FL/FW 2.27; HFL/HFW 2.43; A3 L/W 1.00; 2R1 L/W 2.71.

Type Material. Holotype ♀. Hawai‘i: Kīlauea–Ka‘ū, 4,000 ft [1,220 m], 22 Jun 1966, J.W. Beardsley, BPBMENT 0000018090. Paratype: 1♀, Kīlauea–Ka‘ū, 4,000 ft [1,220 m], 22 Jun 1966, J.W. Beardsley, BPBM.

Etymology. From the Hawaiian *iki*, small, referring to this being the smallest Hawaiian species yet known and one of the smallest in the genus.

Distribution. Known only from two specimens collected together at Kīlauea. Last taken in 1966.

Discussion. This species closely resembles *S. minuta* Fullaway and could be within the range of morphometric variation, but differs structurally in the shape of the head and mandible as noted in the diagnosis. The femora appear to be narrower, but this is an especially variable character. The head also appears to be narrower (WH/LH 0.79–0.81 vs. 0.84–0.86 in *S. minuta*), but the number of specimens of both are limited and they may overlap. The paratype has the head coriaceous and more punctate as in *S. minuta*, but otherwise matches the holotype.

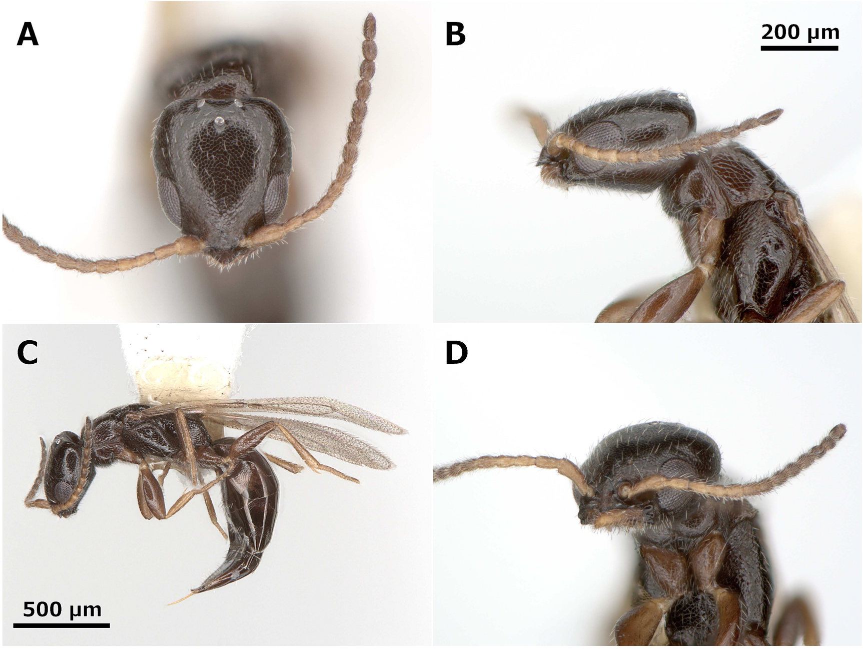


Figure 35. *Sierola iliahi*. A: head, dorsal. B: head, lateral. C: lateral habitus. D: head, frontal.

***Sierola iliahi* n. sp.**

Figure 35, Map 8

Island. Hawai‘i.

Diagnosis. Belonging to the group of species with the clypeus convex dorsally and evenly sloping in profile, with the basal wing cells sparsely setose to glabrous. Immediately recognizable by the peculiar head shape, short and deep with small eyes, and the exceedingly narrow femora.

Description. **Female**. *Head*. Clypeal process short, triangular or semi-elliptical, apex broadly rounded; dorsally rounded, convex, lacking a carina; in profile evenly sloping, nearly straight. Mandible narrow, more or less parallel-sided except at base; apical half of mandible strongly convex outwardly, teeth arrayed on frontal and dorsal surfaces, outwardly coriaceous, somewhat dull; in ventral view weakly curved. Apex of mandible strongly oblique, with small, indistinct teeth. Malar space 1/3 as long as width of base of mandible. Dorsal setae of head shorter than flagellar width. Frons appearing impunctate (setae arising from shallow pits that are only visible at low angles). Vertex and gena setae similar to and only slightly longer than setae of frons. Frons microsculpture finely microreticulate, surface weakly matte. Vertex in dorsal view very slightly concave; occipital margin broadly rounded. Lateral ocelli nearly touching vertex crest. Ocellar triangle front angle weakly acute. Head broadening posterior to eyes. Dorsum of head in lateral view strongly convex, head deepest on line well posterior of eye. Venter of head posterior to mandible flat in lateral view, with relatively sparse setae. Genal angle broadly rounded. Postgenal depression very shallow, nearly absent. Antenna extending to mesonotum.

Mesosoma. Anterior margin of dorsal pronotal area in lateral view evenly rounded. Pronotal setae short, inconspicuous. Propodeal disc laterally coarsely striate; transverse carina faintly present; metapleural carinae complete. Fore femur narrow, over 2.5 times as long as wide, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with smooth but distinct microreticulation over all terga. Sixth sternum narrowly glabrous medially, with moderately dense setae laterally, becoming longer laterad.

Color. Body entirely dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible yellow except black near articulation. Coxae and femora brown, tibiae, tarsi, and trochanters yellow.

Wings. Membrane hyaline. Basal cells of fore wing sparsely setose, with one or two rows of setae in each cell to nearly glabrous, with only a few scattered setae. Cell 1M weakly convex posteriorly, corner posteroapical.

Measurements. LFW 1.54 mm; LM 0.72 mm; WH/LH 0.83; DH/LH 0.59; EV/HE 1.32; EV/WF 0.94; WF/HE 1.41; WH/WF 1.71; OOL/WOT 1.50; DM/LM 0.39; FL/FW 2.67; HFL/HFW 3.07; A3 L/W 2.00; 2R1 L/W 3.6.

Type Material. Holotype ♀. Hawai‘i: Pu‘u Wa‘awa‘a, West Kīleo, 4,300 ft [1,300 m], beating *Santalum*, 27 Jan 2012, K.N. Magnacca, BPBMENT 0000018091.

Etymology. From the Hawaiian *‘iliahi*, sandalwood tree, referring to the type collection.

Distribution. Known only from the holotype, collected at Pu‘u Wa‘awa‘a.

Discussion. This species has among the narrowest fore and hind femora in the genus.

Sierola illingworthi **Fullaway**, **1920**

Figure 36, Map 8

Sierola illingworthi Fullaway, 1920: 142.

Island. Hawai‘i.

Diagnosis. Part of a large complex of species with a sharp, curved to arched clypeal carina, densely setose basal wing cells, lateral ocelli distinctly separate from the vertex crest, and head deep (DH/LH $\geq$0.59). Separated by having the mandible moderately broad, distinctly concave ventrally, and clypeus in profile somewhat short and distinctly recurved at the apex. Closest to *S. fuscipennis* Fullaway in having the frons dull and granular and mandible moderately broad, but in addition to the characters above the vertex and gena setae are elongate and conspicuous (short and similar to those of the frons in *S. fuscipennis*).

Description. **Female**. *Head*. Clypeal process semicircular, apex broadly rounded; dorsally with a sharp carina; in profile evenly curved from base to apex, apical angle slightly acute, or weakly sloping dorsally but strongly rounded and recurved at apex. Mandible moderately broad, distinctly narrowed medially and expanded at apex, ventral margin concave; not twisted, at most weakly convex outwardly, outwardly coriaceous, somewhat dull; in ventral view evenly, moderately curved. Apex of mandible vertical, with equally strong teeth. Malar space very small. Dorsal setae of head distinctly longer than flagellar width. Frons with shallow, close punctures, mostly about 1 pit width apart. Vertex and gena setae conspicuous, nearly twice as long as setae of frons and stronger, erect and directed anterior. Frons microsculpture dull, granular. Vertex in dorsal view more or less straight; occipital margin broadly rounded. Lateral ocelli distinctly separate from vertex crest by less than ocellus length. Ocellar triangle front angle weakly acute. Head more or less parallel-sided for some distance posterior to eyes. Dorsum of head in lateral view slightly convex, head deepest on line through eye. Venter of head posterior to mandible convex in lateral view, with moderately dense pubescence. Genal angle broadly rounded. Postgenal depression shallow, rounded. Antenna extending to pronotum.

Mesosoma. Anterior margin of dorsal pronotal area in lateral view evenly rounded. Pronotal setae elongate, twice as long as flagellar width or more. Propodeal disc laterally shining, with weak microsculpture; metapleural carinae complete. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Highly polished, without a trace of microsculpture. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

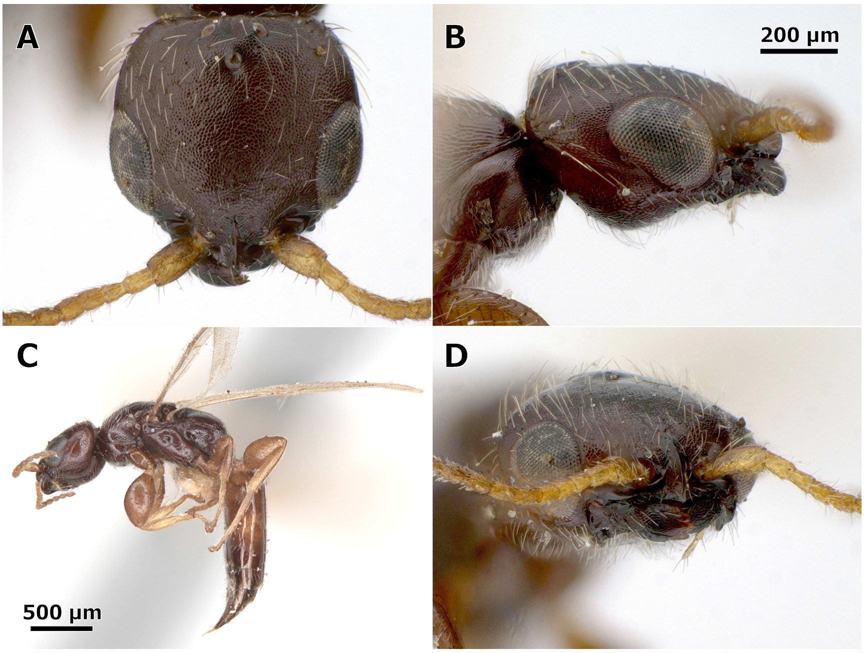


Figure 36. *Sierola illingworthi*. A: head, dorsal. B: head, lateral. C: lateral habitus. D: head, frontal.

Color. Body entirely dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible black. Coxae and femora dark brown to black, tibiae, tarsi, and trochanters yellow.

Wings. Membrane tinged with yellow. Basal cells of fore wing densely and conspicuously setose.

Measurements. LFW 2.34 mm; LM 1.11 mm; WH/LH 0.96 (0.94–0.96); DH/LH 0.62 (0.60–0.62); EV/HE 0.69 (0.62–0.69); EV/WF 0.50 (0.46–0.51); WF/HE 1.38 (1.28–1.38); WH/WF 1.57 (1.57–1.67); OOL/WOT 1.44 (1.24–1.46); DM/LM 0.45; FL/FW 1.85 (1.82–2.00); HFL/HFW 1.94 (1.94–2.23); A3 L/W 1.33 (1.21–1.33). N = 3.

Type Material. Holotype ♀. Hawai‘i: Ka‘ū, 3,600 ft [1,100 m], on ‘a‘ā flows, 18 Jul 1918, W.M. Giffard, BPBMENT 0000000139.

Material examined: 1♀, Hāmākua, 15 Apr 1906, [no collector], BPBM. 1♀, Ka‘ū, 3,600 ft [1,100 m], on ‘a‘ā flows, 18 Jul 1918, W.M. Giffard, BPBM.

Distribution. Very rare, known only from three specimens, two taken at Kīlauea. Last seen in 1918.

Discussion. See comments under *S. fuscipennis*.

***Sierola imparata* Fullaway, 1920**

Figure 37, Map 9

Sierola imparata Fullaway, 1920: 139.

Island. Hawai‘i.

Diagnosis. Part of the species group with a sharp, rather strongly arched clypeal carina, densely setose basal wing cells, and mandible yellow. Closest to *S. lepida* Fullaway and *S. nihoniho* n. sp.; distinguished from the former by having the dorsum of head strongly convex in lateral view, frons distinctly granular and dull, A3 distinctly longer than wide (L/W 1.50–1.65), and fore femur distinctly narrow (FL/FW 2.25–2.45); and from the latter by having the occipital margin narrowed to a ridge and posterior corners of the head more prominent, not so strongly rounded.

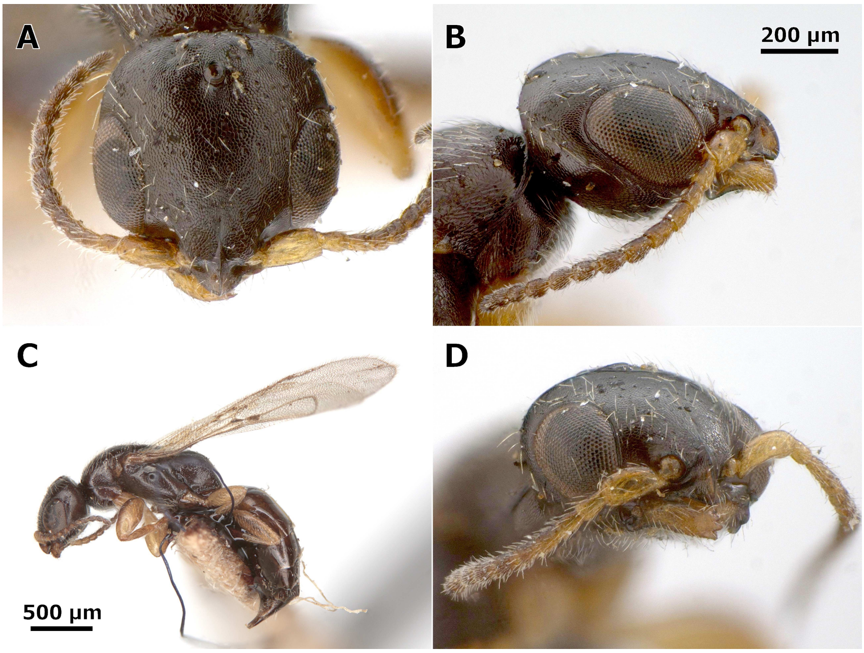


Figure 37. *Sierola imparata*. A: head, dorsal. B: head, lateral. C: lateral habitus. D: head, frontal.

Description. **Female**. *Head*. Clypeal process rounded triangular, apex rounded; dorsally with a sharp carina; in profile strongly arched, vertical or slightly recurved at apex, carina extending above antennal sockets. Mandible moderately narrow, slightly narrowed medially from base, ventral margin weakly concave; not twisted, at most weakly convex outwardly, outwardly coriaceous, somewhat dull; in ventral view evenly, moderately curved. Apex of mandible vertical, with equally strong teeth. Malar space very small. Dorsal setae of head about as long as flagellar width or scarcely longer. Frons with shallow, uneven punctures, 1–3 pit widths apart. Vertex and gena setae distinctly longer than frons setae but only about as thick, not particularly conspicuous. Frons microsculpture dull, granular. Vertex in dorsal view more or less straight; occipital margin broadly rounded. Lateral ocelli nearly touching vertex crest. Ocellar triangle front angle weakly acute. Head rounded shortly posterior to eyes. Dorsum of head in lateral view strongly convex, head deepest on line through eye. Venter of head posterior to mandible convex in lateral view, with relatively sparse setae. Head evenly convex ventrally, genal angle absent. Postgenal depression very shallow, nearly absent. Antenna extending to mesonotum.

Mesosoma. Anterior margin of dorsal pronotal area in lateral view evenly rounded. Pronotal setae longer than flagellar width. Propodeal disc laterally coarsely striate; metapleural carinae complete. Fore femur only moderately expanded, more than twice as long as wide, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Highly polished, without a trace of microsculpture. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Body entirely dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible orange. Legs all yellow except dorsal margins of femora tinged with brown or coxae and basal 2/3 of femora brownish, legs otherwise yellow.

Wings. Membrane hyaline. Basal cells of fore wing densely and conspicuously setose.

Measurements. LFW 2.40 mm; LM 1.23 mm; WH/LH 0.94 (0.88–0.94); DH/LH 0.63 (0.61–0.64); EV/HE 0.52 (0.52–0.72); EV/WF 0.48 (0.48–0.65); WF/HE 1.09 (1.09–1.20); WH/WF 1.76 (1.67–1.76); OOL/WOT 1.17 (1.13–1.43); DM/LM 0.38; FL/FW 2.32 (2.24–2.42); HFL/HFW 2.62 (2.55–2.93); A3 L/W 1.57 (1.38–1.63). N = 4.

Type Material. Holotype ♀. Hawai‘i: Kīlauea, 4,000 ft [1,220 m], dry forest, 1 Aug 1911, W.M. Giffard, BPBMENT 0000000134.

Material examined: 1♀, ‘Ōla‘a, Nov 1896, R.C.L. Perkins, NHMUK 013380215. 1♀, Upper ‘Ōla‘a Forest Reserve, 4,000 ft [1,220 m], 1 Jul 1956, D.E. Hardy, BPBM. 1♀, Kīlauea Iki Rim Trail, 3,800 ft [1,160 m], 23 Jun 1966, J.W. Beardsley, BPBM. 1♀, Hawaii Volcanoes National Park, 1,200 m, fogging *Metros. polymorpha*, 7–3, GRU 1077–003, 7 Oct 1997, D.S. Gruner & D.A. Polhemus, BPBM. 1♀, Upper Waiākea FR, kīpuka 25, 1,721 m, 19.6489°N 155.3625°W, canopy Malaise trap, collection K25-E-M, lot HI-1687, 9 Sep 2009, D. Leopold, BPBM.

Distribution. Rare in wet forest in the Kīlauea–‘Ōla‘a area; known from six specimens, but collected recently.

Sierola indecora Fullaway, 1920

Figure 38, Map 6

Sierola indecora Fullaway, 1920: 134.
Sierola nubila Fullaway, 1920: 135 **n. syn**.

Island. Hawai‘i.

Diagnosis. Belonging in the group of species with a highly arched, thin clypeal carina, strong, conspicuous vertex and gena setae, and densely punctate frons. Separated from *S. ehrhorni* and *S. eucrena* by having the lateral ocelli nearly touching the vertex crest, and from *S. kilauea* by OOL/WOT less than 1.20. The metasoma is also faintly sculpted dorsally and entirely sculpted ventrally, distinguishing it from all three.

Description. **Female**. *Head*. Clypeal process rounded triangular, apex weakly pointed; dorsally with a thin, laminar carina, the sides strongly concave; in profile strongly arched, vertical or slightly recurved at apex, carina extending above antennal sockets. Mandible narrow, more or less parallel-sided or weakly concave; not twisted, at most weakly convex outwardly, outwardly coriaceous, somewhat dull; in ventral view evenly, moderately curved. Apex of mandible vertical, with equally strong teeth. Malar space very small. Dorsal setae of head distinctly longer than flagellar width. Frons with shallow punctures, dense near antennae, 2–3 pit widths apart posterior of midpoint of eyes. Frons microsculpture coriaceous, matte but without strong surface texture. Vertex in dorsal view more or less straight; occipital margin narrowly rounded. Lateral ocelli nearly touching vertex crest. Ocellar triangle front angle right to weakly obtuse. Head rounded shortly posterior to eyes. Dorsum of head in lateral view slightly convex, head deepest on line through eye. Venter of head posterior to mandible flat in lateral view, with moderately dense pubescence. Head evenly convex ventrally, genal angle absent. Postgenal depression absent. Antenna extending to pronotum.

Mesosoma. Pronotal setae longer than flagellar width. Propodeal disc laterally finely, weakly striate; metapleural carinae complete. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with very faint microreticulation over posterior terga. All sterna and ventral portions of terga almost entirely microreticulate. Sixth sternum narrowly glabrous medially, laterally with dense pilose setae.

Color. Body entirely dark brown to black. Antenna dark brown dorsally, yellowish brown ventrally. Mandible black. Coxae and femora dark brown to black, tibiae dark brown, trochanters, tarsi, and bands at bases and apices of tibiae orange.

Wings. Membrane tinged with yellow. Basal cells of fore wing densely and conspicuously setose.

Measurements. LFW 2.14 mm; LM 1.13 mm; WH/LH 0.88 (0.85–0.91); DH/LH 0.60 (0.55–0.60); EV/HE 0.62 (0.55–0.69); EV/WF 0.54 (0.51–0.63); WF/HE 1.14 (1.05–1.14);

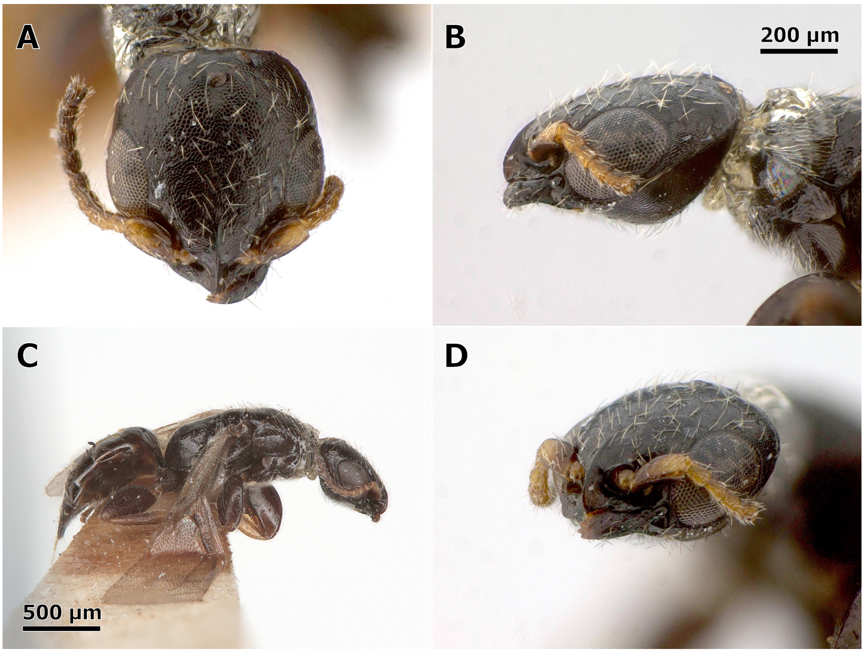


Figure 38. *Sierola indecora*. A: head, dorsal. B: head, lateral. C: lateral habitus. D: head, frontal.

WH/WF 1.60 (1.60–1.73); OOL/WOT 1.15 (1.04–1.20); DM/LM 0.42; FL/FW 2.00 (1.94–2.07); HFL/HFW 2.34 (2.19–2.37); A3 L/W 1.08 (1.00–1.22); 2R1 L/W 2.82. N = 7.

Type Material. Holotype ♀ of *Sierola indecora*. Hawai‘i: Kīlauea, 4,000 ft [1,220 m], Oct 1915, W.M. Giffard, BPBMENT 0000000124.

Holotype ♀ of *Sierola nubila*. Hawai‘i: Kīlauea, 4,000 ft [1,220 m], 11 Jan 1919, W.M. Giffard, BPBMENT 0000000125

Material examined: 1♀, Humu‘ula, 7 Aug 1946, E.C. Zimmerman, BPBM. 3♀, Mauna Loa Strip Road, 5,300 ft [1,620 m], D-Vac sample ex *Acacia koa*, 6 Mar 1973, J. Leeper, BPBM. 1♀, Hawaii Volcanoes National Park, 1,200 m, fogging *Metros. polymorpha*, 6–4, GRU 7003–001, 7 Oct 1997, D.S. Gruner, BPBM. 1♀, Upper Waiākea FR, kīpuka 37, 1,665 m, 19.6615°N 155.3534°W, ‘ōhi‘a canopy branch clipping, collection K37-TR1–2009, lot HI-1246, 11 Aug 2009, D. Leopold & B. Hwang, UMD. 1♀, Upper Waiākea Forest Reserve, kīpuka 33, 19.6430°N 155.3480°W, clip *M. polymorpha*, K33-TR1–2010 HI-2123, 28 Jul 2010, D. Leopold & B. Hwang, BPBM. 1♀ 2♂, Upper Waiākea Forest Reserve, kīpuka 35, 19.6480°N 155.3710°W, clip *M. polymorpha*, H.12.244, 12 Apr 2012, E. Wilson & D. Leopold, UMD.

Distribution. Widespread around the island but uncommon, known from less than ten specimens.

Discussion. The holotypes of both *S. indecora* and *S. nubila* are somewhat damaged; the head of the former has been detached and reglued, and in the process the long vertex setae broken off, while the latter also has damage to the wings and setae. They are identical in head, wing, and mandible characters, and cannot otherwise be distinguished except that the type of *S. nubila* is somewhat smaller and less sculpted. More recent, intact specimens match both exactly. I have chosen the holotype of *S. indecora* to represent the species due to its closer similarity to the recent specimens, especially the clearer ventral head setae. The relatively strong sculpting of the ventral metasoma that readily distinguishes this species from *S. kilauea* and other related species is often hard to see due to specimens often being curled up, but it is present on the ventrolateral portion of T2 which is usually visible. Some additional specimens besides those listed may belong here.

***Sierola kaapeha* n. sp.**

Figure 39, Map 9

Island. Hawai‘i.

Diagnosis. Belonging to the group of species with the head and mesosoma compressed and more or less flattened, sharp clypeal carina, and basal wing cells sparsely setose. Readily distinguished from similar species by the broad head, clypeus evenly curved in profile and mandible moderately narrow, distinctly concave ventrally.

Description. **Female**. *Head*. Clypeal process semicircular, apex broadly rounded; dorsally with a sharp carina; in profile evenly curved from base to apex, apical angle slightly acute. Mandible moderately narrow at base, distinctly broader on apical half, ventral margin distinctly concave; apical half of mandible strongly convex outwardly, teeth arrayed on frontal and dorsal surfaces, outwardly shining but with distinct, fine microsculpture; in ventral view evenly, moderately curved. Apex of mandible vertical, with teeth distinctly stronger ventrally. Malar space almost absent. Dorsal setae of head about as long as flagellar width or scarcely longer. Frons moderately punctate, about 2–3 pit widths apart. Vertex and gena setae similar to and only slightly longer than setae of frons. Frons microsculpture finely microreticulate, surface weakly matte. Vertex in dorsal view more or less straight; occipital margin narrowly rounded. Lateral ocelli distinctly separate from vertex crest by less than ocellus length. Ocellar triangle front angle weakly acute. Head more or less parallel-sided for some distance posterior to eyes. Dorsum of head in lateral view nearly flat, head deepest on line through posterior margin of eye. Venter of head posterior to mandible convex in lateral view, with relatively sparse setae. Head weakly convex to nearly flat ventrally, genal angle absent. Postgenal depression absent. Antenna extending to pronotum.

Mesosoma. Strongly dorsoventrally compressed. Anterior margin of dorsal pronotal area in lateral view evenly rounded, pronotal disc distinctly flattened. Pronotal setae about as long as flagellar width or scarcely longer. Propodeal disc laterally shining, with weak microsculpture; metapleural carinae present posteriorly, fading anteriorly. Fore femur robust, about twice as long as high and strongly convex dorsally, with both anterior and posterior surfaces convex, not strongly compressed, more or less straight in dorsal view.

Metasoma. Shining, with very faint microreticulation over posterior terga. Sixth sternum broadly glabrous medially, with sparse setae laterally.

Color. Body entirely dark brown to black. Antenna entirely dark brown except ventral side of basal segments yellowish. Mandible black. Coxae and femora dark brown to black, tibiae, tarsi, and trochanters brownish orange.

Wings. Membrane hyaline. Basal cells of fore wing sparsely setose, with one or two rows of setae in each cell. Cell 1M weakly convex posteriorly, corner posteroapical.

Measurements. LFW 1.99 mm; LM 0.95 mm; WH/LH 0.85; DH/LH 0.48; EV/HE 0.88; EV/WF 0.67; WF/HE 1.30; WH/WF 1.61; OOL/WOT 1.62; DM/LM 0.32; FL/FW 2.00; HFL/HFW 2.05; A3 L/W 1.06; 2R1 L/W 3.33.

Type Material. Holotype ♀. Hawai‘i: Mauna Loa Strip Road, 5,300 ft [1,620 m], D-Vac sample ex *Acacia koa*, 19 Jul 1971, J. Leeper, BPBMENT 0000018092. Paratypes: 1♀, Kīlauea Forest, D-Vac sample ex *Acacia koa*, 2 Jun 1972, J. Leeper, BPBM. 1♀, Mauna Loa Strip Road, 4,300 ft [1,300 m], D-Vac sample ex *Acacia koa*, 13 Oct 1973, J. Leeper, BPBM.

Etymology. From the Hawaiian *ka‘apeha*, spread wings, referring to the holotype specimen's unusual position with the wings out.

Distribution. Known from only three specimens, all collected north of Kīlauea between 1971–73.

***Sierola kaawale* n. sp.**

Figure 40, Map 9

Island. Hawai‘i.

Diagnosis. Very distinctive among the Hawai‘i species by the combination of moderately broad, ventrally concave mandible, mostly glabrous basal wing cells, clypeus rounded

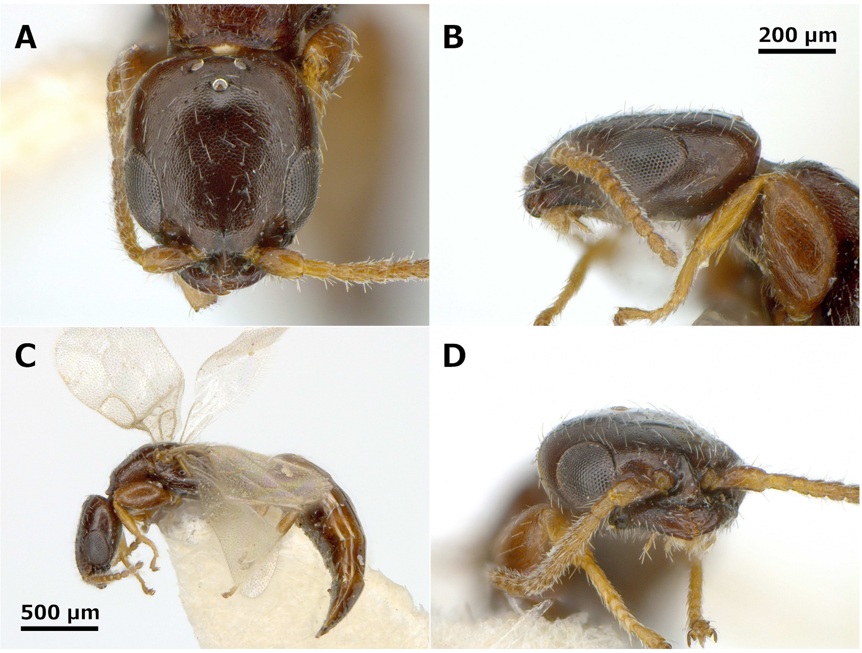


Figure 39. *Sierola kaapeha*. A: head, dorsal. B: head, lateral. C: lateral habitus. D: head, frontal.

and recurved in profile, and moderately broad fore femur. Nearly identical to *S. cryptophlebiae* Fullaway of Oʻahu, differing only in having the antenna dark at the apex, and head more strongly convex ventrally, slightly wider and shorter behind the eyes.

Description. **Female**. *Head*. Clypeal process semicircular, apex rounded; dorsally with a sharp carina; in profile weakly sloping dorsally but strongly rounded and recurved at apex. Mandible moderately broad, distinctly narrowed medially and expanded at apex, ventral margin concave; not twisted, at most weakly convex outwardly, outwardly coriaceous, somewhat dull; in ventral view evenly, moderately curved. Apex of mandible vertical, with equally strong teeth. Malar space almost absent. Dorsal setae of head shorter than flagellar width. Frons with distinct, uneven punctures, 1–3 pit widths apart. Vertex and gena setae distinctly longer than frons setae but only about as thick, not particularly conspicuous. Frons microsculpture coriaceous, matte but without strong surface texture, or finely microreticulate, surface weakly matte. Vertex in dorsal view more or less straight; occipital margin broadly rounded. Lateral ocelli distinctly separate from vertex crest by less than ocellus length. Ocellar triangle front angle strongly acute. Head more or less parallel-sided for some distance posterior to eyes. Dorsum of head in lateral view slightly convex, head deepest on line through posterior margin of eye. Venter of head posterior to mandible convex in lateral view, with relatively sparse setae. Head evenly convex ventrally, genal angle absent. Postgenal depression absent. Antenna extending to anterior margin of pronotum.

Mesosoma. Anterior margin of dorsal pronotal area in lateral view evenly rounded. Pronotal setae about as long as flagellar width or scarcely longer. Propodeal disc laterally shining, with weak microsculpture; metapleural carinae complete. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with faint microsculpture laterally. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Body entirely dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible black. Legs all yellow except base of fore coxa brown.

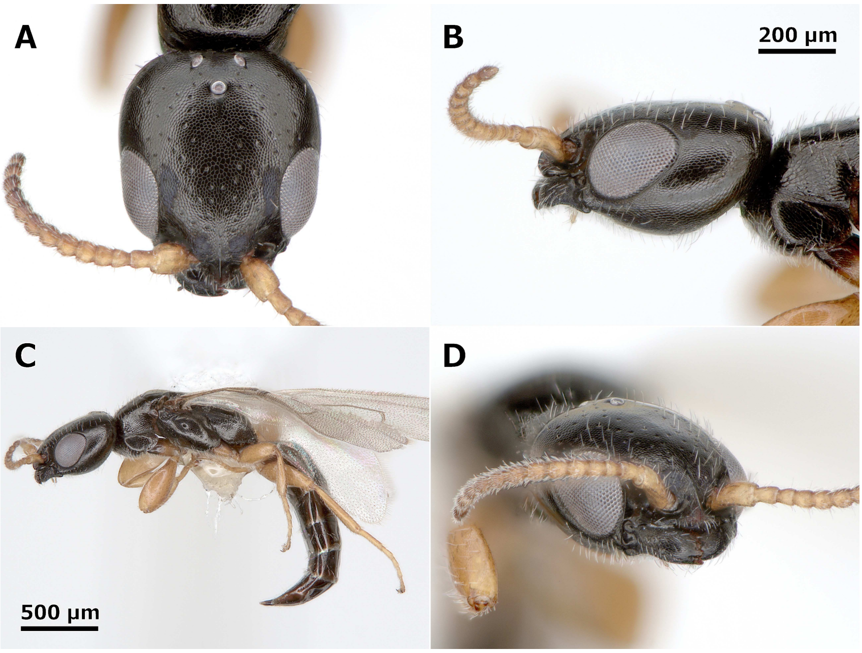


Figure 40. *Sierola kaawale*. A: head, dorsal. B: head, lateral. C: lateral habitus. D: head, frontal.

Wings. Membrane hyaline. Basal cells of fore wing nearly glabrous, with only few scattered setae.

Measurements. LFW 2.31 mm; LM 1.01 mm; WH/LH 0.85; DH/LH 0.57; EV/HE 0.84; EV/WF 0.73; WF/HE 1.16; WH/WF 1.73; OOL/WOT 1.80; DM/LM 0.38; FL/FW 2.04; HFL/HFW 2.32; A3 L/W 0.86; 2R1 L/W 3.

Type Material. Holotype ♀. Hawai‘i: Pu‘u Wa‘awa‘a, 4,950 ft [1,510 m], sweeping, 4 Aug 2009, K.N. Magnacca, BPBMENT 0000018093.

Etymology. From the Hawaiian *ka‘awale*, isolated or alone, referring to the holotype being collected as a single specimen among a large number of another species.

Distribution. Known only from the holotype, taken in mesic forest at Pu‘u Wa‘awa‘a.

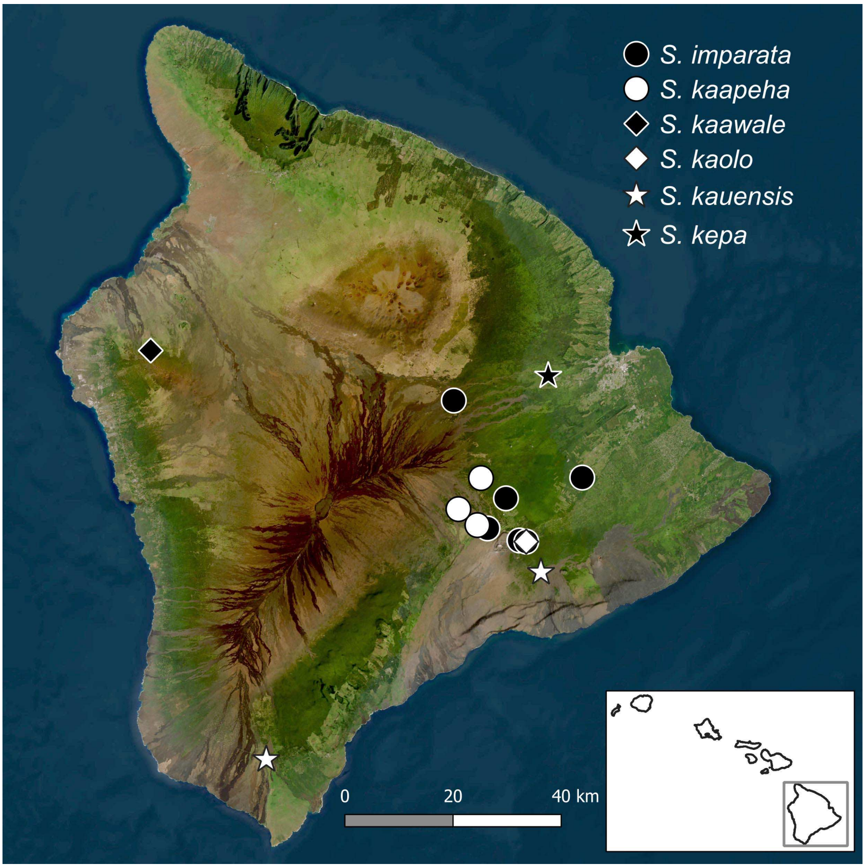
Sierola kaolo n. sp.

Figure 41, Map 9

Island. Hawai‘i.

Diagnosis. Belonging to the group of species with the head broad and strongly convex or produced ventrally, frons smooth and shining, clypeus lacking a sharp carina and evenly curved in profile, and basal wing cells glabrous to sparsely setose. Separated from related species by the deep postgenal depression, sparsely setose basal wing cells, clypeus with a rounded carina, head strongly convex dorsally, and black mandible which is moderately broad, strongly convex outwardly, and weakly concave ventrally.

Description. **Female**. *Head*. Clypeal process semicircular, apex rounded; dorsally with a rounded carina dorsally, effaced towards apex; in profile evenly curved from base to apex, apical angle slightly acute. Mandible moderately broad, slightly narrowed medially and expanded at apex, ventral margin weakly concave; apical half of mandible strongly convex outwardly, teeth arrayed on frontal and dorsal surfaces, outwardly polished and shining distal of bend, coriaceous and dull basally; in ventral view obtusely elbowed. Apex of mandible vertical, with teeth distinctly stronger ventrally. Malar space very small. Dorsal setae of head about as



Map 9. Collection localities of *Sierola imparata, S. kaapeha, S. kaawale, S. kaolo, S. kauensis*, and *S. kepa.*

long as flagellar width or scarcely longer. Frons with distinct, uneven punctures, 1–3 pit widths apart. Vertex and gena setae distinctly longer than frons setae but only about as thick, not particularly conspicuous. Frons microsculpture evident but smooth, shining. Vertex in dorsal view more or less straight; occipital margin broadly rounded. Lateral ocelli nearly touching vertex crest. Ocellar triangle front angle right. Head rounded shortly posterior to eyes. Dorsum of head in lateral view strongly convex, head deepest on line through eye. Venter of head posterior to mandible flat in lateral view, with relatively sparse setae. Genal angle prominent, apex rounded, head distinctly triangular in lateral view. Gena ventral to eye concave. Postgenal depression deep, distinct, V-shaped. Antenna extending to pronotum.

Mesosoma. Anterior margin of dorsal pronotal area in lateral view evenly rounded. Pronotal setae about as long as flagellar width or scarcely longer. Propodeal disc laterally finely, weakly striate; median carina faintly present; metapleural carinae complete. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Highly polished, without a trace of microsculpture. Sixth sternum narrowly glabrous medially, laterally with dense pilose setae.

Color. Body entirely dark brown to black. Antenna dark brown dorsally, yellowish brown ventrally. Mandible black. Coxae and basal 2/3 of femora brownish, legs otherwise yellow.

Wings. Membrane tinged with yellow. Basal cells of fore wing sparsely setose, with one or two rows of setae in each cell.

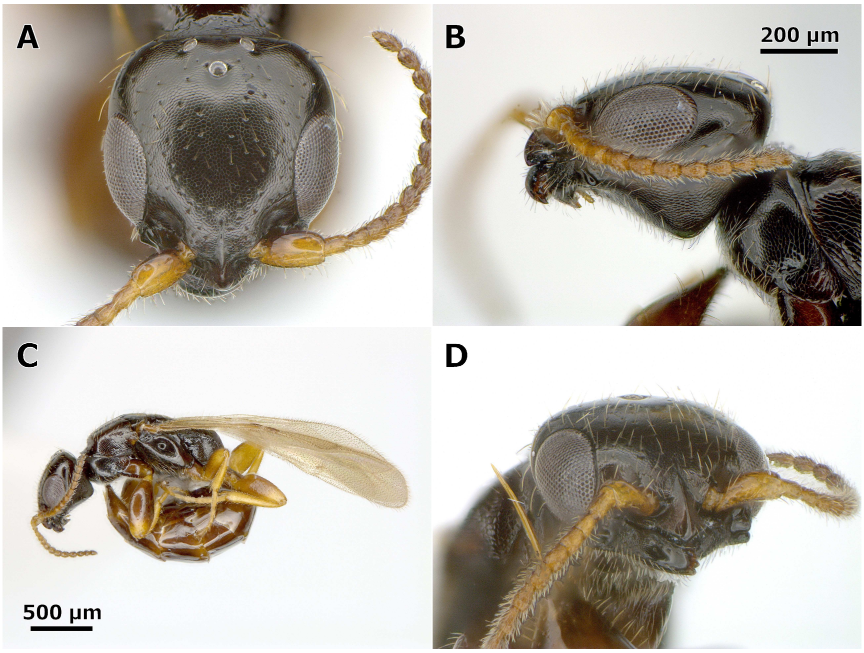


Figure 41. *Sierola kaolo*. A: head, dorsal. B: head, lateral. C: lateral habitus. D: head, frontal.

Measurements. LFW 2.28 mm; LM 1.18 mm; WH/LH 0.93; DH/LH 0.67; EV/HE 0.63; EV/WF 0.50; WF/HE 1.25; WH/WF 1.67; OOL/WOT 1.16; DM/LM 0.37; FL/FW 1.95; HFL/HFW 2.44; A3 L/W 1.43; 2R1 L/W 3.09.

Type Material. Holotype ♀. Hawai‘i: Hawaii Volcanoes National Park, 1,200 m, fogging *Metros. polymorpha*, 9–1, GRU 1162–003, 8 Oct 1997, D.S. Gruner, BPBMENT 0000018094.

Etymology. From the Hawaiian *ka‘olo*, sagging flesh of the neck or double chin, referring to the protruding gena.

Distribution. Known only from the holotype, taken by canopy fogging at Kīlauea.

Sierola kauensis Fullaway, 1920

Figure 42, Map 9

Sierola kauensis Fullaway, 1920: 75.

Island. Hawai‘i.

Diagnosis. A distinctive species, easily recognized among those with a sharp clypeal carina and densely setose basal wing cells by the broad, deep head (WH/LH ~0.98, DH/LH ~0.68), broad fore femur (FL/FW ~1.75), and distinct postgenal depression. Closest to *S. illingworthi* on Hawai‘i and *S. obscura* Fullaway of O‘ahu; separated from both by the postgenal depression and having the lateral ocelli nearly touching the vertex crest, and additionally from the latter by the densely setose wing cells.

Description. **Female**. *Head*. Clypeal process semicircular, apex pointed; dorsally with a sharp carina; in profile evenly curved from base to apex, apical angle slightly acute. Mandible moderately broad, distinctly narrowed medially and expanded at apex, ventral margin concave; apical half of mandible strongly convex outwardly, teeth arrayed on frontal and dorsal surfaces, outwardly shining but with distinct, fine microsculpture; in ventral view evenly, moderately curved. Apex of mandible vertical, with equally strong teeth. Malar space almost absent. Dorsal setae of head distinctly longer than flagellar width. Frons with shallow, uneven punctures, 1–3 pit widths apart. Vertex and gena setae conspicuous, nearly twice as long as setae of frons and stronger, erect and directed anterior. Frons microsculpture coriaceous, matte but without

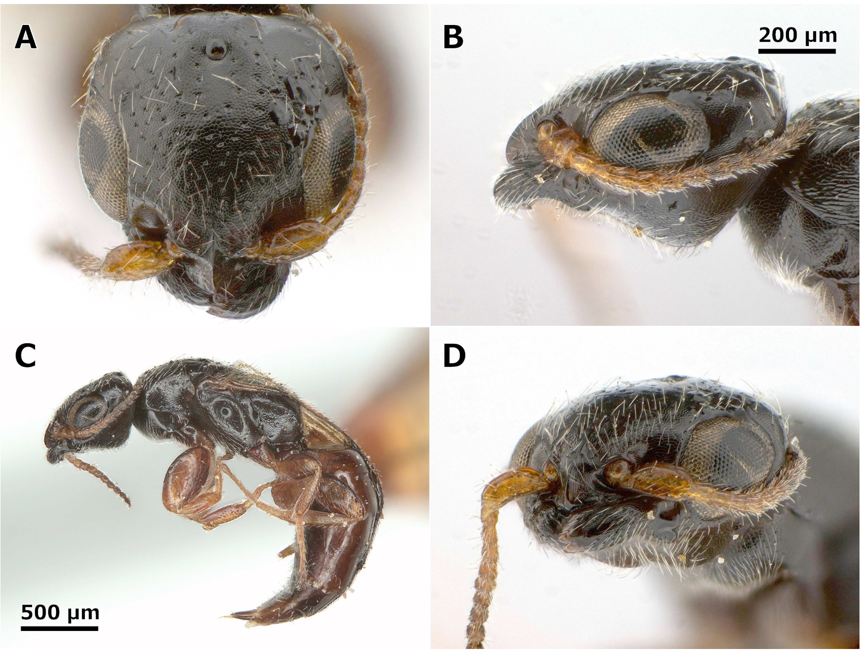


Figure 42. *Sierola kauensis*. A: head, dorsal. B: head, lateral. C: lateral habitus. D: head, frontal.

strong surface texture. Vertex in dorsal view more or less straight; occipital margin broadly rounded. Lateral ocelli nearly touching vertex crest. Ocellar triangle front angle weakly acute. Head rounded shortly posterior to eyes. Dorsum of head in lateral view strongly convex, head deepest on line through posterior margin of eye. Venter of head posterior to mandible concave in lateral view, with moderately dense pubescence. Genal angle broadly rounded. Postgenal depression shallow, rounded. Antenna extending to pronotum.

Mesosoma. Anterior margin of dorsal pronotal area in lateral view evenly rounded. Pronotal setae elongate, twice as long as flagellar width or more. Propodeal disc laterally finely, weakly striate; metapleural carinae complete. Fore femur strongly expanded, less than twice as long as wide, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with faint microsculpture laterally. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Body entirely dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible black. Coxae and femora dark brown to black, tibiae, tarsi, and trochanters yellow.

Wings. Basal cells of fore wing densely and conspicuously setose.

Measurements. LFW 2.35 mm; LM 1.21 mm; WH/LH 0.98; DH/LH 0.68; EV/HE 0.56; EV/WF 0.43; WF/HE 1.30; WH/WF 1.60; OOL/WOT 1.29; DM/LM 0.46; FL/FW 1.74; HFL/HFW 2.26; A3 L/W 1.33.

Type Material. Holotype ♀. Hawai‘i: Kahuku, 2,000 ft [600 m], 27 Jul 1918, W.M. Giffard, BPBMENT 0000000007.

Material examined: 1♀, Chain of Craters Rd nr. ‘Ālo‘i Crater, 3,000 ft [900 m], 23 Jun 1966, J.W. Beardsley, BPBM.

Distribution. Very rare, known only from the holotype and one other specimen. Last collected in 1966.

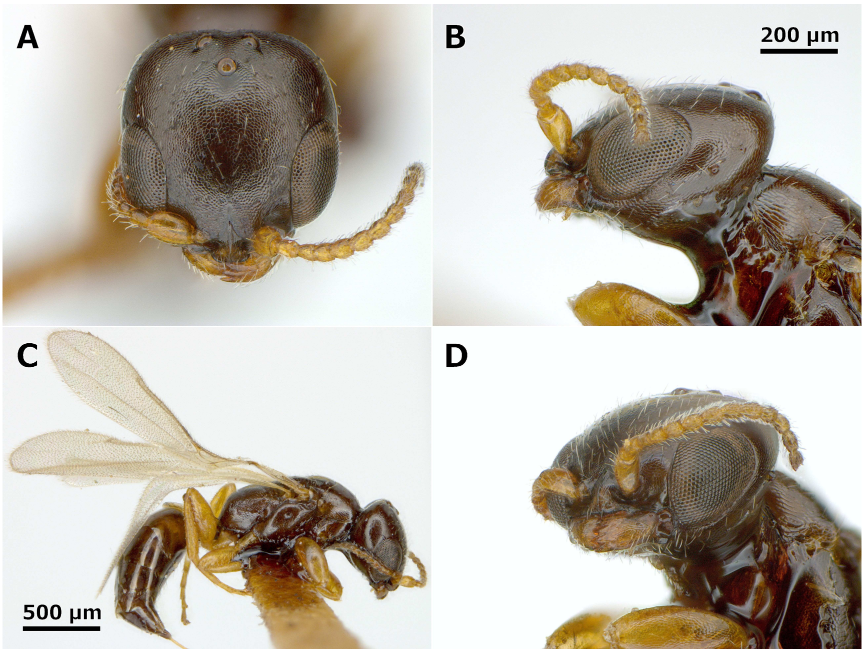


Figure 43. *Sierola kepa*. A: head, dorsal. B: head, lateral. C: lateral habitus. D: head, frontal.

***Sierola kepa* n. sp.**

Figure 43, Map 9

Island. Hawai‘i.

Diagnosis. A distinctive species with a short, deep head, the clypeus trapezoidal and distinctly truncate apically, dorsally somewhat carinate but usually weakly so, mandible reddish brown and moderately broad, and basal wing cells densely setose. Closest to *S. aristoteliae* Fullaway and *S. manono* Magnacca of O‘ahu; differing in lacking the conspicuous pilose head setation of those species, having the clypeus recurved in profile, and the vertex narrowly, shallowly, but distinctly emarginate between lateral ocelli.

Description. **Female**. *Head*. Clypeal process trapezoidal, apex truncate; dorsally with a sharp carina, or weakly carinate; in profile weakly sloping dorsally but strongly rounded and recurved at apex. Mandible moderately broad, slightly narrowed medially and expanded at apex, ventral margin weakly concave; slightly twisted, outwardly coriaceous, somewhat dull; in ventral view obtusely elbowed. Apex of mandible vertical, with teeth distinctly stronger ventrally. Malar space almost absent. Dorsal setae of head about as long as flagellar width or slightly shorter. Frons with distinct punctures, dense near antennae and eyes, 2–3 pit widths apart or more in central frons. Vertex and gena setae similar to and only slightly longer than setae of frons. Frons microsculpture coriaceous, matte but without strong surface texture. Vertex in dorsal view slightly sinuate around the ocellar triangle; occipital margin broadly rounded. Lateral ocelli distinctly separate from vertex crest by less than ocellus length. Ocellar triangle front angle strongly to weakly acute. Head more or less parallel-sided for some distance posterior to eyes. Eye setae short, only about as long as 1–2 ommatidia. Dorsum of head in lateral view strongly convex, head deepest on line through eye. Venter of head posterior to mandible convex in lateral view, with relatively sparse setae. Head strongly convex ventrally, genal angle absent. Antenna extending to pronotum.

Mesosoma. Anterior margin of dorsal pronotal area in lateral view evenly rounded.

Pronotal setae short, inconspicuous. Propodeal disc laterally finely, weakly striate; metapleural carinae complete. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with smooth but distinct microreticulation over all terga. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Body entirely dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible reddish brown to yellow. Legs all yellow.

Wings. Membrane hyaline. Basal cells of fore wing densely and conspicuously setose. Cell 1M weakly convex posteriorly, corner posteroapical.

Measurements. LFW 2.02 mm; LM 0.97 mm; WH/LH 0.94; DH/LH 0.64; EV/HE 0.69; EV/WF 0.66; WF/HE 1.05; WH/WF 1.80; OOL/WOT 1.50; DM/LM 0.39; FL/FW 2.08; HFL/HFW 2.62; A3 L/W 1.10; 2R1 L/W 2.8.

Type Material. Holotype ♀. Hawai‘i: Kaumana, 29 Apr 1920, O.H. Swezey, BPBMENT 0000018095.

Etymology. From the Hawaiian *kepa*, notched, referring to the narrow emargination between the ocelli.

Distribution. Known only from the holotype, collected in wet forest above Hilo in 1920.

***Sierola kikanu* n. sp.**

Figure 44, Map 10

Island. Hawai‘i.

Diagnosis. Among species with a sharp clypeal carina, densely setose basal wing cells, and lateral ocelli separated from the vertex crest, easily recognized by the combination of the head narrow (WH/LH 0.78–0.83), clypeus recurved in profile, and mandible moderately broad, distinctly concave ventrally. The head is rather elongate and parallel-sided posterior to the eyes which gives it a different habitus than most others in this group. Closest to *S. pakua* n. sp., which in addition to having the lateral ocelli nearly touching the vertex crest, has the head shorter (OOL/WOT 1.20–1.50, vs. 1.65–1.90 for *S. kikanu*).

Description. **Female**. *Head*. Clypeal process semicircular, apex rounded; dorsally with a sharp carina; in profile evenly curved from base to apex, apical angle slightly acute, or weakly sloping dorsally but strongly rounded and recurved at apex. Mandible moderately broad, distinctly narrowed medially and expanded at apex, ventral margin concave; apical half of mandible strongly convex outwardly, teeth arrayed on frontal and dorsal surfaces, outwardly coriaceous, somewhat dull; in ventral view evenly, moderately curved. Apex of mandible vertical, with teeth distinctly stronger ventrally. Malar space almost absent. Dorsal setae of head about as long as flagellar width or scarcely longer. Frons with distinct, uneven punctures, 1–3 pit widths apart. Vertex and gena setae distinctly longer than frons setae but only about as thick, not particularly conspicuous. Frons microsculpture finely microreticulate, surface weakly matte to coriaceous, matte but without strong surface texture. Vertex in dorsal view more or less straight; occipital margin broadly rounded. Lateral ocelli distinctly separate from vertex crest by less than ocellus length. Ocellar triangle front angle weakly to strongly acute. Head more or less parallel-sided for some distance posterior to eyes. Dorsum of head in lateral view nearly flat posterior to middle of eyes, head deepest on line through posterior margin of eye. Venter of head posterior to mandible convex in lateral view, with moderately dense pubescence. Head weakly convex ventrally, genal angle absent. Postgenal depression very shallow, nearly absent. Antenna extending to pronotum.

Mesosoma. Anterior margin of dorsal pronotal area in lateral view evenly rounded. Pronotal setae longer than flagellar width. Propodeal disc laterally finely, weakly striate; metapleural carinae present posteriorly, fading anteriorly. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with faint microsculpture laterally. Sixth sternum broadly glabrous medially, with moderately dense setae laterally.

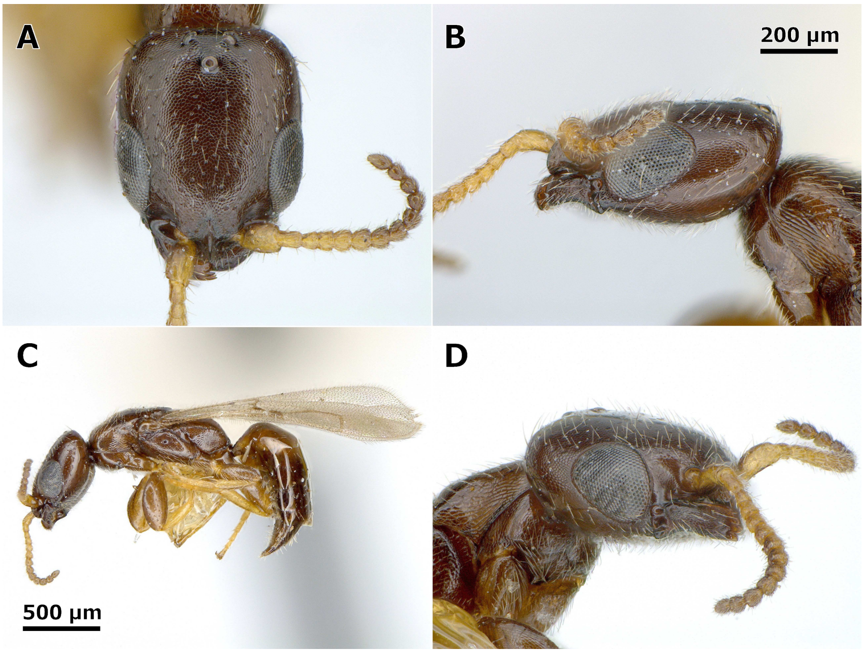


Figure 44. *Sierola kikanu*. A: head, dorsal. B: head, lateral. C: lateral habitus. D: head, frontal.

Color. Body entirely dark brown to black. Antenna dark brown dorsally, yellowish brown ventrally. Mandible black. Coxae and femora dark brown to black, tibiae dark brown, trochanters, tarsi, and bands at bases and apices of tibiae orange.

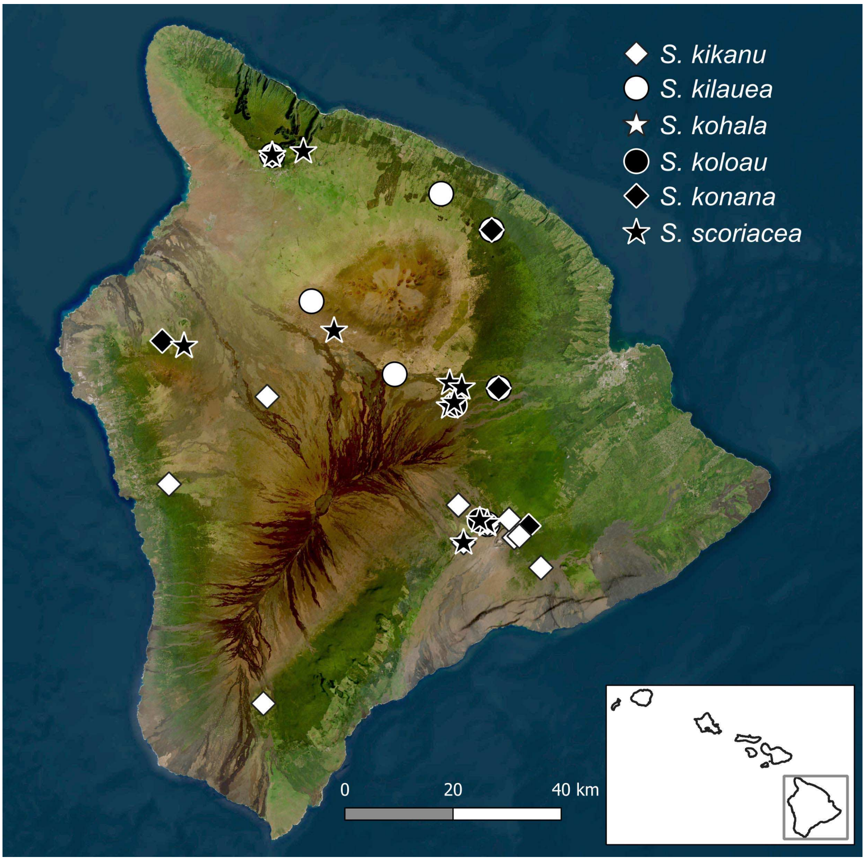
Wings. Membrane hyaline. Basal cells of fore wing densely and conspicuously setose. Cell 1M weakly convex posteriorly, corner posteroapical.

Measurements. LFW 1.86 mm; LM 0.91 mm; WH/LH 0.80 (0.78–0.83); DH/LH 0.55 (0.51–0.56); EV/HE 0.94 (0.91–1.08); EV/WF 0.79 (0.74–0.85); WF/HE 1.20 (1.15–1.27); WH/WF 1.60 (1.60–1.72); OOL/WOT 1.65 (1.65–1.99); DM/LM 0.40; FL/FW 2.12 (1.96–2.24); HFL/HFW 2.38 (2.15–2.38); A3 L/W 0.90 (0.90–1.06); 2R1 L/W 3.06. N = 9.

Type Material. Holotype ♀. Hawai‘i: Kīlauea–Ka‘ū, 1,200 m, 22 Jun 1966, J.W. Beardsley, BPBMENT 0000018096. Paratypes: 1♀, Ka‘ū, 3,600 ft [1,100 m], on ‘a‘ā flows, 18 Jul 1918, W.M. Giffard, BPBM. 1♀, Kealakekua, 3,500 ft [1,070 m], on *Straussia hillebrandii* [= *Psychotria hawaiiensis*], 11 Aug 1919, P.H. Timberlake, UCRC ENT 556763. 2♀, Kīlauea, Byron's Ledge, 12 Jul 1934, O.H. Swezey, BPBM. 1♀, Kīlauea, Nāpau Trail, ex *Cyperus*, 18 Jul 1934, O.H. Swezey, BPBM. 1♀, Hawaii National Park, Kīlauea Sec., *Gouldia* [= *Kadua*] seeds, 17 May 1948, C.J. Davis, BPBM. 8♀, Kīlauea-Ka‘ū, 4,000 ft [1,220 m], 22 Jun 1966, J.W. Beardsley, BPBM. 2♀, Kīlauea Iki Rim Trail, 3,800 ft [1,160 m], 23 Jun 1966, J.W. Beardsley, BPBM. 2♀, ‘Ālo‘i Crater, nr. Chain of Craters Rd, 3,000 ft [900 m], 23 Jun 1966, J.W. Beardsley, BPBM. 3♀, Mauna Loa Strip Road, 5,300 ft [1,620 m], D-Vac sample ex *Acacia koa*, 6 Mar 1973, J. Leeper, BPBM. 1♀, Mauna Loa Strip Road, IBP Study Site, 1,586 m, *Acacia koa*, Aug 1974, J. Leeper, BPBM. 1♀, Pōhakuloa Training Area, Kīpuka ‘Alalā, LO6 217, 17 Jan 2001, P. Oboyski *et al*., USNM. 1♀, Kahuku Ranch, yellow sticky card, site #5K-5, card II, 23 Feb 2007, BPBM.

Etymology. From the Hawaiian *kīkanu*, covered or buried, referring to the collection of several specimens at ‘Ālo‘i crater, which was filled in and buried during the 1969–74 Mauna Ulu eruptions.

Distribution. Collected primarily in dry to mesic forest in the Kīlauea area, with scattered specimens from widely separated sites to the north and west.



Map 10. Collection localities of *Sierola kikanu, S. kilauea, S. kohala, S. koloau, S. konana*, and *S. scoriacea*.

Sierola kilauea Fullaway, 1920

Figure 45, Map 10

Sierola kilauea Fullaway, 1920: 111.

Island. Hawai‘i.

Diagnosis. Belonging in the group of species with a highly arched, thin clypeal carina, strong, conspicuous vertex and gena setae, and densely punctate frons. Separated from *S. ehrhorni* and *S. eucrena* by having the lateral ocelli nearly touching the vertex crest, and from *S. indecora* by OOL/WOT greater than 1.20 and having the metasoma mostly polished dorsally and at least some areas polished ventrally. Closest to *S. pokii* n. sp. and *S. scoriacea*, distinguished by having the femora narrow (FL/FW 2.10–2.25, HFL/HFW 2.50–2.75), and additionally from the former by the straight vertex crest and highly arched, blunt clypeus in profile. Very similar to *S. olympiana* Fullaway of O‘ahu, essentially differing only in lacking dorsal microsculpture on the metasoma and the hind femur usually broader.

Description. **Female**. *Head*. Clypeal process rounded triangular, apex weakly pointed; dorsally with a thin, laminar carina, the sides strongly concave; in profile strongly arched, vertical or slightly recurved at apex, carina extending above antennal sockets. Mandible narrow, more or less parallel-sided except at base; not twisted, at most weakly convex outwardly, outwardly coriaceous, somewhat dull; in ventral view evenly, moderately curved. Apex of mandible vertical, with equally strong teeth. Malar space very small. Dorsal setae

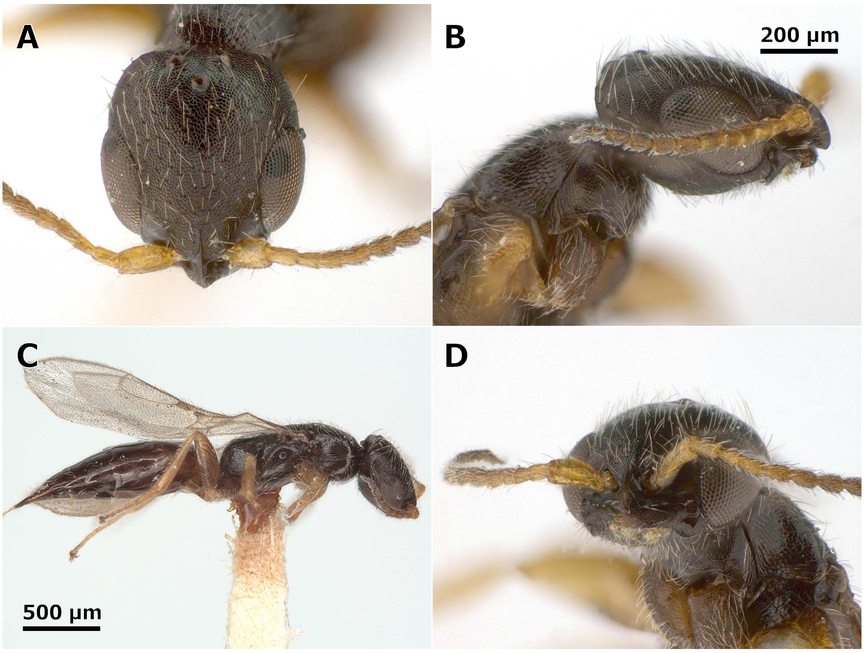


Figure 45. *Sierola kilauea*. A: head, dorsal. B: head, lateral. C: lateral habitus. D: head, frontal.

of head distinctly longer than flagellar width. Frons with shallow, close punctures, mostly about 1 pit width apart. Vertex and gena setae conspicuous, nearly twice as long as setae of frons and stronger, erect and directed anterior. Frons microsculpture dull, granular, or coriaceous, matte but without strong surface texture. Vertex in dorsal view more or less straight; occipital margin not carinate but forming a pronounced ridge. Lateral ocelli nearly touching vertex crest. Ocellar triangle front angle right. Head rounded shortly posterior to eyes. Dorsum of head in lateral view slightly convex, head deepest on line through eye. Venter of head posterior to mandible convex in lateral view, with relatively sparse setae. Head evenly convex ventrally, genal angle absent. Gena ventral to eye flat. Postgenal depression very shallow, nearly absent. Antenna extending to posterior margin of pronotum.

Mesosoma. Anterior margin of dorsal pronotal area in lateral view evenly rounded. Pronotal setae longer than flagellar width. Propodeal disc laterally coarsely striate; metapleural carinae complete. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Highly polished, without a trace of microsculpture. Sixth sternum narrowly glabrous medially, laterally with dense pilose setae.

Color. Body entirely dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible black (may rarely be yellow). Legs all yellow or coxae and femora dark brown to black, tibiae, tarsi, and trochanters yellow.

Wings. Membrane tinged with yellow. Basal cells of fore wing densely and conspicuously setose.

Measurements. LFW 2.00 mm; LM 0.99 mm; WH/LH 0.85 (0.80–0.85); DH/LH 0.58 (0.55–0.60); EV/HE 0.69 (0.69–0.82); EV/WF 0.65 (0.63–0.72); WF/HE 1.06 (1.06–1.15); WH/WF 1.75 (1.63–1.75); OOL/WOT 1.22 (1.22–1.44); DM/LM 0.38; FL/FW 2.17 (2.11–2.30); HFL/HFW 2.58 (2.52–2.75); A3 L/W 1.43 (1.17–1.52); 2R1 L/W 3.08. N = 8.

Type Material. Holotype ♀. Hawai‘i: Kīlauea, 4,000 ft [1,220 m], numbered 7, 7 Apr 1908, W.M. Giffard, BPBMENT 0000000079.

Material examined: 1♀, Kīlauea, 4,000 ft [1,220 m], 9 Nov 1919, F.X. Williams, BPBM. 1♀, Humu‘ula, *Myoporum*, 31 Jul 1935, R.L. Usinger, BPBM. 1♀, Forest above Pa‘auilo, 3,000 ft [910

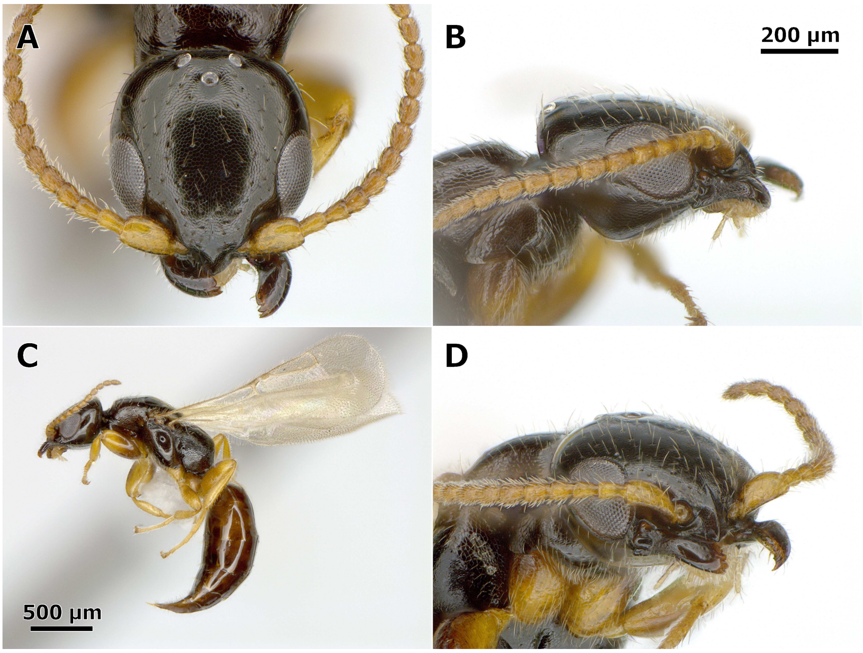


Figure 46. *Sierola kohala*. A: head, dorsal. B: head, lateral. C: lateral habitus. D: head, frontal.

m], 28 Aug 1963, D.E. Hardy, BPBM. 1♀, Ahumoa crater, 7,000 ft [2,130 m], 18 May 1966, J.W. Beardsley, BPBM. Laupāhoehoe Forest Reserve, 1,219 m, fogging *Metros. polymorpha*, D.S. Gruner: 1♀, A5–4, GRU 4323–003, 4 Jun 1997; 1♀, B3–2, GRU 5174–001, 6 Nov 1997, BPBM. Kohala Forest Reserve, 1,158 m, fogging *Metros. polymorpha*, D.S. Gruner & D.A. Polhemus: 1♀, 3–2, GRU 0506–010, 12 Oct 1997; 1♀, 9–3, GRU 0725–008, 14 Oct 1997, BPBM. Upper Waiākea Forest Reserve, 1,280 m, clipping *Metros. polymorpha*, D.S. Gruner: 1♀, 7-A, GRU 2099–001, 25 Aug 1998; BPBM. 1♀, 23-B, GRU 2294–001, 27 Aug 1998; 1♀, 6-GP, GRU 2726–001, 31 Oct 1999; 1♀, 17-G, GRU 2995–001, 14 Dec 1999; 1♀, 7-A, GRU 7208–001, 18 Apr 2001, BPBM.

Distribution. Widespread and moderately common.

Discussion. See comments under *S. scoriacea*.

***Sierola kohala* n. sp.**

Figure 46, Map 10

Island. Hawai‘i.

Diagnosis. Belonging to the group of species with the head broad and strongly convex or produced ventrally, frons smooth and shining, clypeus lacking a carina and evenly curved in profile, and basal wing cells glabrous to sparsely setose. Separated from related species by the sparsely setose basal wing cells, weakly angulate clypeus, head strongly convex dorsally, and black mandible which is twisted and distinctly concave ventrally. Very similar to *S. mamua* n. sp., distinguished by the twisted black mandible and more strongly convex head.

Description. **Female**. *Head*. Clypeal process rounded triangular, apex weakly pointed; dorsally weakly carinate; in profile evenly curved from base to apex, apical angle slightly acute. Mandible moderately narrow at base, distinctly broader on apical half, ventral margin distinctly concave; strongly twisted, outwardly shining but with distinct, fine microsculpture; in ventral view obtusely elbowed. Apex of mandible vertical, with equally strong teeth. Malar space very small. Dorsal setae of head about as long as flagellar width or scarcely longer. Frons moderately punctate, about 2–3 pit widths apart. Vertex and gena setae similar to and only slightly longer than setae of frons. Frons microsculpture evident but smooth, shining. Vertex in dorsal view more or less straight; occipital margin broadly rounded. Lateral ocelli nearly touching vertex crest. Ocellar triangle front angle weakly obtuse. Head rounded shortly posterior to eyes. Dorsum of head in lateral view slightly convex, head deepest on line through eye. Venter of head posterior to mandible convex in lateral view, with relatively sparse setae. Genal angle prominent, apex rounded, head distinctly triangular in lateral view. Postgenal depression shallow, rounded. Antenna extending to mesonotum.

Mesosoma. Anterior margin of dorsal pronotal area in lateral view evenly rounded. Pronotal setae short, inconspicuous. Propodeal disc laterally coarsely striate; transverse carina faintly present, curving on each side; metapleural carinae present posteriorly, fading anteriorly. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with smooth but distinct microreticulation over all terga. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Body entirely dark brown to black. Antenna yellow, tinged with brown dorsally. Mandible black. Coxae and basal 2/3 of femora brownish, legs otherwise yellow.

Wings. Membrane tinged with yellow. Basal cells of fore wing sparsely setose, with one or two rows of setae in each cell.

Measurements. LFW 2.00 mm; LM 1.01 mm; WH/LH 0.90 (0.89–0.92); DH/LH 0.65 (0.63–0.67); EV/HE 0.76 (0.74–0.82); EV/WF 0.58 (0.56–0.63); WF/HE 1.32 (1.26–1.35); WH/WF 1.60 (1.58–1.65); OOL/WOT 1.12 (1.12–1.26); DM/LM 0.44; FL/FW 1.92 (1.84–2.00); HFL/HFW 2.64 (2.48–2.64); A3 L/W 1.30 (1.14–1.43); 2R1 L/W 3.06. N = 10.

Type Material. Holotype ♀. Hawai‘i: Kohala Forest Reserve, 1,158 m, fogging *Metros. polymorpha*, 8–3, GRU 0690–003, 14 Oct 1997, D.S. Gruner & D.A. Polhemus, BPBMENT 0000018097. Paratypes: 4♀, same data as holotype (specimens: 8–3 GRU 0690–004; 8–3, GRU 0690–005; 8–3, GRU 0690–0069–2, GRU 0711–005), BPBM. 5♀, same data as holotype, 12 Oct 1997 (specimens: 1–1, GRU 0436–006; 3–5, GRU 0534–003; 3–5, GRU 0534–004; 3–5, GRU 0534–006; 5–3, GRU 0598–007), BPBM.

Etymology. Named for the Kohala region of Hawai‘i, where all specimens were collected.

Distribution. Known only from canopy fogging collections; a long series taken in Kohala.

***Sierola koloau* n. sp.**

Figure 47, Map 10

Island. Hawai‘i.

Diagnosis. Easily recognized by the combination of clypeus rounded triangular, weakly carinate dorsally, and elongate in profile, apical angle strongly acute; head strongly flattened, DH/LH ~0.50; and basal wing cells densely setose. Very similar to *S. konana* Fullaway and *S. volcanica* Fullaway; readily distinguished by the weakly carinate clypeus, mandible only moderately twisted, and narrow frons (WF/HE ~1.03 vs. 1.26–1.41 in those species).

Description. **Female**. *Head*. Clypeal process rounded triangular, apex weakly pointed; dorsally weakly carinate; in profile elongate, evenly curved, apex acute. Mandible narrow, slightly expanded at base and apex, ventral margin weakly concave; slightly twisted, outwardly coriaceous, somewhat dull; in ventral view obtusely elbowed. Apex of mandible vertical, with teeth distinctly stronger ventrally. Malar space 1/4 as long as width of base of mandible. Dorsal setae of head about as long as flagellar width or scarcely longer. Frons with shallow punctures, dense near antennae, 2–3 pit widths apart posterior of midpoint of eyes. Vertex and gena setae similar to and only slightly longer than setae of frons. Frons microsculpture coriaceous, matte but without strong surface texture. Vertex in dorsal view more or less straight; occipital margin broadly rounded. Lateral ocelli distinctly separate from vertex crest by less than ocellus length. Ocellar triangle front angle weakly acute. Head more or less parallel-sided for some distance posterior to eyes. Dorsum of head in lateral view slightly convex, head deepest on line through posterior margin of eye. Venter of head posterior to mandible flat in lateral view, with relatively sparse setae. Head weakly convex ventrally, genal angle absent. Postgenal depression absent. Antenna extending to posterior margin of pronotum.

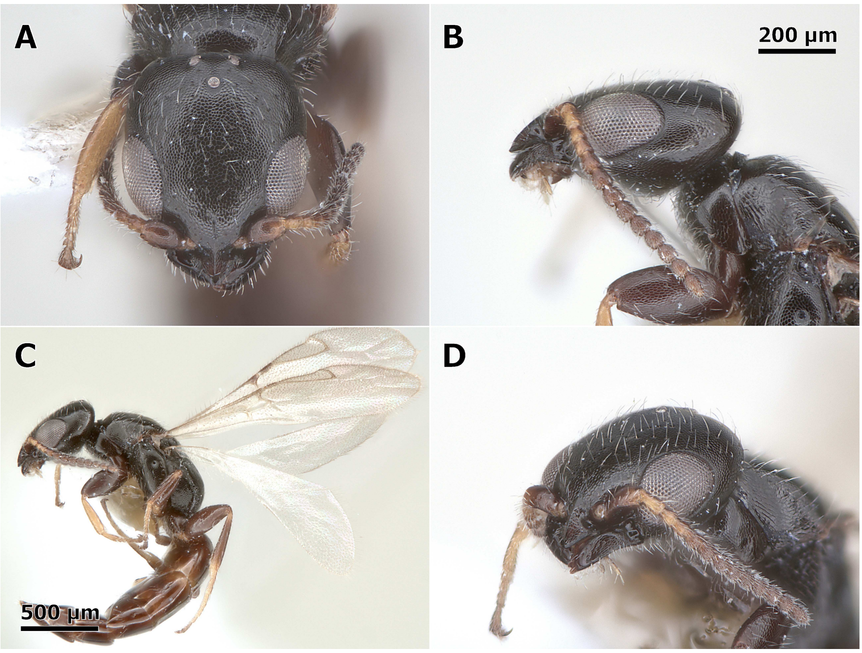


Figure 47. *Sierola koloau*. A: head, dorsal. B: head, lateral. C: lateral habitus. D: head, frontal.

Mesosoma. Anterior margin of dorsal pronotal area in lateral view weakly angulate. Pronotal setae longer than flagellar width. Propodeal disc laterally finely, weakly striate; metapleural carinae complete. Fore femur only moderately expanded, more than twice as long as wide, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with faint microsculpture laterally. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Body entirely dark brown to black. Antenna entirely dark brown except ventral side of basal segments yellowish. Mandible black. Coxae and femora dark brown to black, fore tibia and tarsi yellow, mid and hind tibiae brown with yellow bands at bases and apices.

Wings. Membrane hyaline. Basal cells of fore wing densely and conspicuously setose. Cell 1M weakly convex posteriorly, corner posteroapical.

Measurements. LFW 1.92 mm; LM 0.90 mm; WH/LH 0.80; DH/LH 0.50; EV/HE 0.79; EV/WF 0.77; WF/HE 1.03; WH/WF 1.87; OOL/WOT 1.68; DM/LM 0.44; FL/FW 2.22; HFL/HFW 2.41; A3 L/W 1.00; 2R1 L/W 2.48.

Type Material. Holotype ♀. Hawai‘i: Upper Waiākea FR, kīpuka 38, 1731 m, canopy Malaise trap, collection K38-C-M1, lot HI-0646, 9 Apr 2009, D. Leopold, BPBMENT 0000018098. Paratypes: 2♀, same data as holotype, BPBM. 1♀, Kīpuka Kī, yellow sticky card, site #16, card H, 2 May 2003, BPBM.

Etymology. From the Hawaiian *koloau*, stretched out, referring to the elongate appearance of the head in lateral view.

Distribution. Very rare, known only from four specimens.

Discussion. The presence of this species only in two very small kīpuka in the 1855 and 1881 Mauna Loa lava flows suggests it may actually prefer early successional forest on younger lava flows. These habitats have not been extensively sampled, especially in the canopy. Kīpuka Kī, the other collection site, is older forest but has a history of disturbance, so may present a similar habitat.

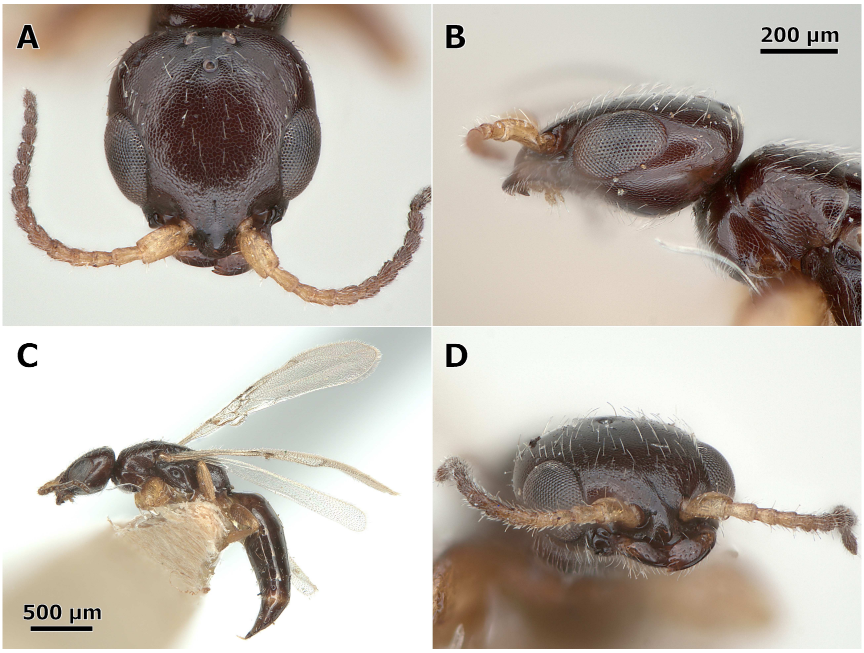


Figure 48. *Sierola konana*. A: head, dorsal. B: head, lateral. C: lateral habitus. D: head, frontal.

***Sierola konana* Fullaway, 1920**

Figure 48, Map 10

Sierola konana Fullaway, 1920: 83.
Sierola muiri Fullaway, 1920: 80 **n**. **syn**.

Island. Hawai‘i.

Diagnosis. Belonging to the group of species lacking a clypeal carina and with the mandible strongly twisted. Separated from similar species by having a distinct malar space, the clypeus convex dorsally, and head moderately broad (WH/LH 0.88–0.94). The last separates it from *S. volcanica* Fullaway, which is otherwise nearly identical. Close to *S. kahuku* Magnacca of O‘ahu, distinguished by the narrower hind femur (HFL/HFW 2.35–2.60), sparse ventral head setae, and clypeus never angulate dorsally.

Description. **Female**. *Head*. Clypeal process semicircular, apex broadly rounded; dorsally rounded, convex, lacking a carina; in profile evenly curved from base to apex, apical angle slightly acute. Mandible narrow, slightly expanded at base and apex, ventral margin weakly concave; strongly twisted, outwardly polished, smooth, shining; in ventral view obtusely elbowed. Apex of mandible vertical, with equally strong teeth. Malar space 1/3 as long as width of base of mandible. Dorsal setae of head about as long as flagellar width or scarcely longer. Frons with shallow, uneven punctures, 1–3 pit widths apart. Vertex and gena setae similar to and only slightly longer than setae of frons. Frons microsculpture finely microreticulate, surface weakly matte. Vertex in dorsal view more or less straight; occipital margin broadly rounded. Lateral ocelli distinctly separate from vertex crest by less than ocellus length. Ocellar triangle front angle strongly acute. Head rounded shortly posterior to eyes. Dorsum of head in lateral view slightly convex, head deepest on line through eye. Venter of head posterior to mandible convex in lateral view, with relatively sparse setae. Head evenly convex ventrally, genal angle absent. Postgenal depression shallow, rounded. Antenna extending to posterior margin of pronotum.

Mesosoma. Anterior margin of dorsal pronotal area in lateral view evenly rounded. Pronotal setae longer than flagellar width. Propodeal disc laterally finely, weakly striate; metapleural carinae present posteriorly, fading anteriorly. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with faint microsculpture laterally. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Body entirely dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible black. Hind coxa and femur brown except at apices, fore and mid femora tinged with brown dorsally, legs otherwise yellow.

Wings. Membrane hyaline. Basal cells of fore wing densely and conspicuously setose.

Measurements. LFW 2.12 mm; LM 1.02 mm; WH/LH 0.92 (0.88–0.94); DH/LH 0.53 (0.51–0.56); EV/HE 0.76 (0.70–0.84); EV/WF 0.57 (0.55–0.65); WF/HE 1.32 (1.26–1.37); WH/WF 1.65 (1.59–1.67); OOL/WOT 1.65 (1.45–1.65); DM/LM 0.39; FL/FW 2.00 (1.97–2.13); HFL/HFW 2.39 (2.35–2.59); A3 L/W 1.23 (1.17–1.48); 2R1 L/W 2.95. N = 10.

Type Material. Holotype ♀ of *Sierola konana*. Hawai‘i: Pu‘u Wa‘awa‘a, 3,800 ft [1,160 m], Aug 1917, W.M. Giffard, BPBMENT 0000000024.

Holotype ♀ of *Sierola muiri*. Hawai‘i: Kīlauea, 4,000 ft [1,220 m], 19 Jan 1917, W.M. Giffard & F. Muir, BPBMENT 0000000019.

Material examined: 1♀, Kīlauea, 4,000 ft [1,220 m], 8 Jun 1908, W.M. Giffard, BPBM (paratype of *S. muiri*). 2♀, Volcano Village, along Wright Rd, 3860 ft [1180 m], yellow sticky board trap, 20 Oct-3 Nov 1995, W.D. Perreira, BPBM. 1♀, Laupāhoehoe Forest Reserve, 1,219 m, fogging *Metros. polymorpha*, A5–1, GRU 4290–007, 4 Jun 1997, D.S. Gruner, BPBM. 1♀, same data, A7–6, GRU 4376–001, 5 Jun 1997, BPBM. 3♀, Kohala Forest Reserve, 1,158 m, fogging *Metros. polymorpha*, 12 Oct 1997, D.S. Gruner & D.A. Polhemus (specimens: 3–2, GRU 0506–009; 1–2, GRU 0454–012; 5–1, GRU 0589–007), BPBM. 1♀, same data, 11–1, GRU 0769–001, 14 Oct 1997, BPBM. 1♀, Laupāhoehoe Forest Reserve, 1,219 m, fogging *Metros. polymorpha*, B4–1, GRU 5214–003, 6 Nov 1997, D.S. Gruner, BPBM. 1♀, Upper Waiākea Forest Reserve, 1,280 m, clipping *Metros. polymorpha*, 4-B, GRU 2057–002, 25 Aug 1998, D.S. Gruner, BPBM.

Distribution. Widespread in wet to mesic forest, found broadly across the windward side and at Pu‘u Wa‘awa‘a.

Discussion. The type of *S. konana* differs from that of *S. muiri* Fullaway only in a slight difference in the degree of curvature of the clypeus. All the definitive specimens have the same unusual leg coloration. Three additional specimens with the femora entirely dark brown appear to fit here, but are outliers in one or more important morphometric characters. They do not form a distinct unit – one has broad femora while another has very narrow femora. These differences do not seem sufficient to describe them as distinct species at this time, but their identity with *S. konana* is questionable. Very close to and somewhat intergrading with *S. volcanica* Fullaway; see comments under that species.

***Sierola koolau* n. sp.**

Figure 49, Map 11

Island. Hawai‘i.

Diagnosis. Part of a complex of species with a sharp, evenly curved clypeal carina, broad head, long third antennal segment, and sparsely setose to glabrous basal wing cells. Very similar to *S. nukupio* n. sp. and *S. puuwaawaa* Fullaway, differing from both in having the metasoma smoothly but distinctly microreticulate all over and vertex slightly emarginate between the lateral ocelli.

Description. **Female**. *Head*. Clypeal process semicircular, apex broadly rounded; dorsally with a sharp carina; in profile evenly curved from base to apex, apical angle slightly acute. Mandible moderately narrow, more or less parallel-sided except at base; not twisted, at most weakly convex outwardly, outwardly coriaceous, somewhat dull; in ventral view evenly, moderately curved. Apex of mandible vertical, with equally strong teeth. Malar space very small. Dorsal setae of head about as long as flagellar width or scarcely longer. Frons moderately punctate, about 2–3 pit widths apart. Vertex and gena setae distinctly

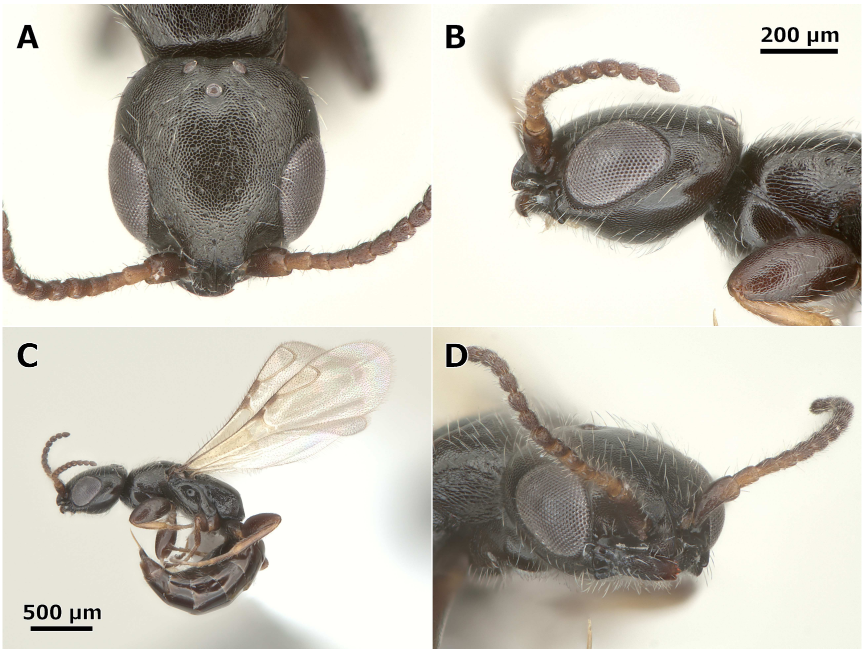


Figure 49. *Sierola koolau*. A: head, dorsal. B: head, lateral. C: lateral habitus. D: head, frontal.

longer than frons setae but only about as thick, not particularly conspicuous. Frons microsculpture coriaceous, matte but without strong surface texture to dull, granular. Vertex in dorsal view shallowly emarginate between ocelli, otherwise straight; occipital margin broadly rounded. Lateral ocelli distinctly separate from vertex crest by less than ocellus length. Ocellar triangle front angle weakly acute. Head more or less parallel-sided for some distance posterior to eyes. Dorsum of head in lateral view slightly convex, head deepest on line through eye. Venter of head posterior to mandible convex in lateral view, with relatively sparse setae. Head evenly convex ventrally, genal angle absent. Postgenal depression very shallow, nearly absent. Antenna extending to posterior margin of pronotum.

Mesosoma. Anterior margin of dorsal pronotal area in lateral view evenly rounded. Pronotal setae longer than flagellar width. Propodeal disc laterally finely, weakly striate; metapleural carinae complete. Fore femur only moderately expanded, more than twice as long as wide, strongly laterally compressed, slightly arcuate in dorsal view.

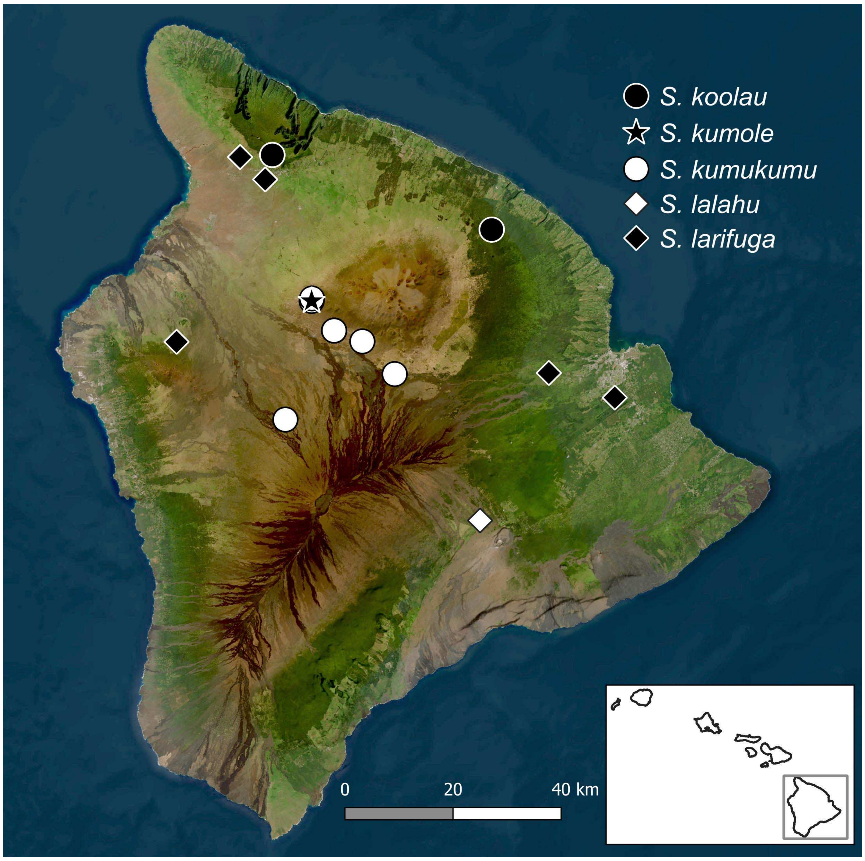
Metasoma. Shining, with smooth but distinct microreticulation over all terga. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Body entirely dark brown to black. Antenna entirely dark brown to black. Mandible black. Coxae and femora dark brown to black, fore tibia and tarsi yellow, mid and hind tibiae brown with yellow bands at bases and apices.

Wings. Membrane tinged with yellow. Basal cells of fore wing sparsely setose, with one or two rows of setae in each cell (cell R sometimes appearing nearly glabrous). Cell 1M weakly convex posteriorly, corner posteroapical.

Measurements. LFW 2.08 mm; LM 1.06 mm; WH/LH 0.90 (0.88–0.93); DH/LH 0.60 (0.58–0.60); EV/HE 0.65 (0.59–0.77); EV/WF 0.58 (0.52–0.68); WF/HE 1.11 (1.09–1.19); WH/WF 1.69 (1.65–1.72); OOL/WOT 1.26 (1.26–1.41); DM/LM 0.36; FL/FW 2.17 (2.11–2.36); HFL/HFW 2.42 (2.33–2.67); A3 L/W 1.28 (1.23–1.50); 2R1 L/W 2.37. N = 9.

Type Material. Holotype ♀. Hawai‘i: Kohala Forest Reserve, 1,158 m, fogging *Metros. polymorpha*, 4–3, GRU 0576–005, 12 Oct 1997, D.S. Gruner & D.A. Polhemus, BPBMENT 0000018099.



Map 11. Collection localities of *Sierola koolau, S. kumole, S. kumukumu*, *S. lalahu*, and *S. larifuga.*

Patatypes: 2♀, Laupāhoehoe Forest Reserve, 1219 m, fogging *Metros. polymorpha*, 5 Jun 1997, D.S. Gruner (specimens: A7-5, GRU 4361-002; A6-2, GRU 4344-001), BPBM. 1♀, Laupāhoehoe Forest Reserve, 1219 m, fogging *Metros*. polymorpha, B2-4, GRU 5121-001, 6 Jun 1997, D.S. Gruner, BPBM. 3♀, Kohala Forest Reserve, 1158 m, fogging *Metros. polymorpha*, 12 Oct 1997, D.S. Gruner & D.A. Polhemus (specimens: 4-2, GRU 0564-003; 4-2, GRU 0564-007; 5-3, GRU 0598-004), BPBM.

Etymology. From the Hawaiian *ko'olau*, windward, referring to the broad distribution of this species across the eastern wet side of the island.

Distribution. Widely distributed in wet forest on the windward side of the island.

Discussion. This species is known exclusively from specimens collected since 1996. All come from canopy sampling, which may explain why it was not collected earlier.

Sierola kumole n. sp.

Figure 50, Map 11

Island. Hawai'i.

Diagnosis. Recognized by having the clypeus semi-elliptical, dorsally angulate but lacking a sharply raised carina, and evenly sloping in profile; mandible yellow and strongly convex outwardly, moderately narrow and distinctly concave ventrally; and basal wing cells sparsely setose. Closest to *S. milo* n. sp., separated by the paler mandible, head deep (DH/LH 0.64 vs. 0.56) with the posterior corners strongly rounded off, and narrow fore and hind femora.

Description. **Female**. *Head*. Clypeal process short, triangular or semi-elliptical, apex weakly pointed; dorsally weakly carinate; in profile evenly sloping, nearly straight. Mandible

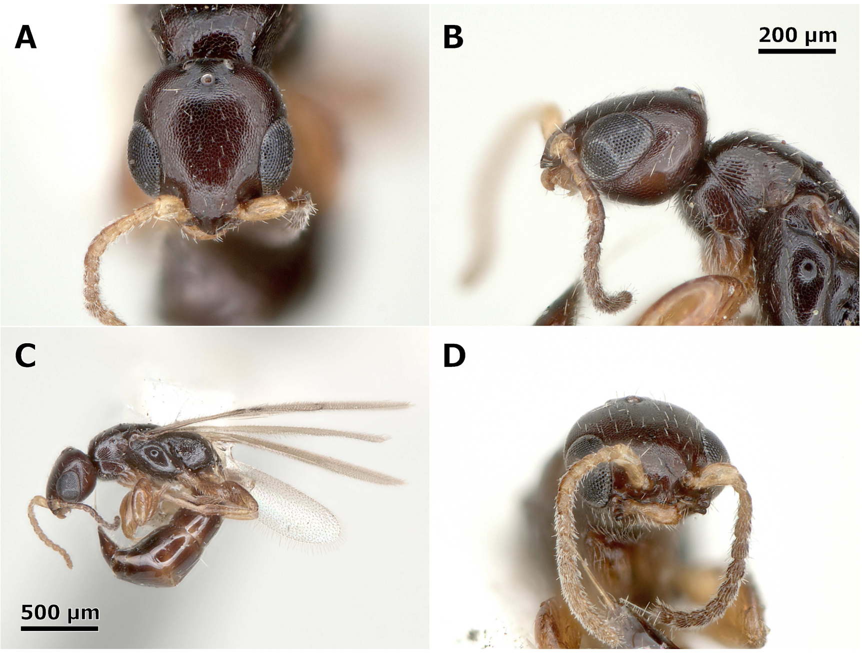


Figure 50. *Sierola kumole*. A: head, dorsal. B: head, lateral. C: lateral habitus. D: head, frontal.

moderately narrow at base, distinctly broader on apical half, ventral margin distinctly concave; apical half of mandible strongly convex outwardly, teeth arrayed on frontal and dorsal surfaces, outwardly polished, smooth, shining; in ventral view evenly, moderately curved. Apex of mandible vertical, with equally strong teeth. Malar space very small. Dorsal setae of head about as long as flagellar width or scarcely longer. Frons with shallow, uneven punctures, 1–3 pit widths apart. Vertex and gena setae distinctly longer than frons setae but only about as thick, not particularly conspicuous. Frons microsculpture finely microreticulate, surface weakly matte. Vertex in dorsal view more or less straight, corners strongly rounded off; occipital margin broadly rounded. Lateral ocelli nearly touching vertex crest. Ocellar triangle front angle weakly to strongly obtuse. Head rounded shortly posterior to eyes. Dorsum of head in lateral view slightly convex, head deepest on line through posterior margin of eye. Venter of head posterior to mandible convex in lateral view, with relatively sparse setae. Head strongly convex ventrally, genal angle absent. Postgenal depression very shallow, nearly absent. Antenna extending to posterior margin of pronotum.

Mesosoma. Anterior margin of dorsal pronotal area in lateral view evenly rounded. Pronotal setae about as long as flagellar width or scarcely longer. Propodeal disc laterally coarsely striate; transverse carina faintly present, curving on each side; metapleural carinae complete. Fore femur only moderately expanded, more than twice as long as wide, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with faint microsculpture laterally. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Body entirely dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible yellow. Coxae and femora brown, all tibiae and tarsi yellow-brown.

Wings. Membrane weakly infuscate. Basal cells of fore wing sparsely setose, with one or two rows of setae in each cell. Cell 1M weakly convex posteriorly, corner posteroapical.

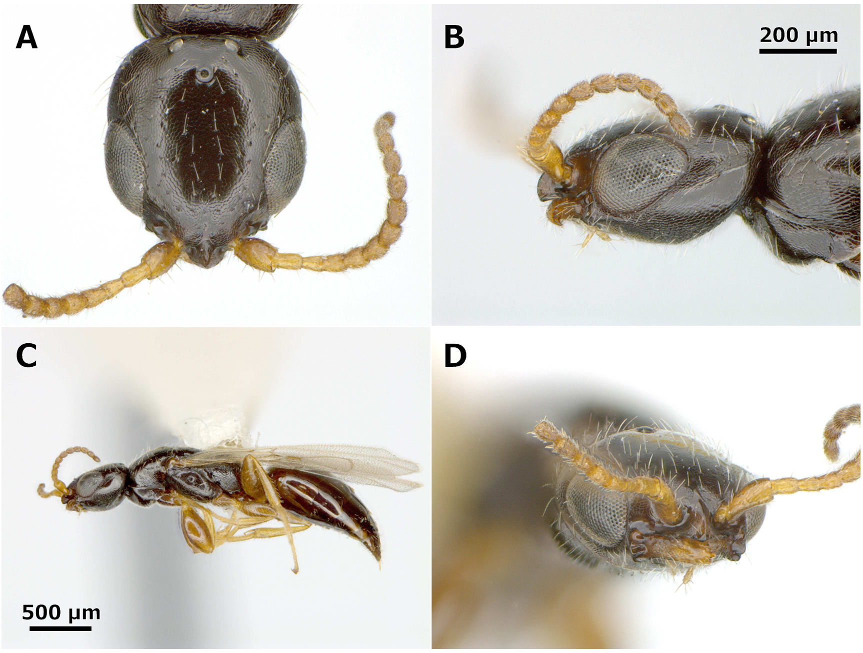


Figure 51. *Sierola kumukumu*. A: head, dorsal. B: head, lateral. C: lateral habitus. D: head, frontal.

Measurements. LFW 1.89 mm; LM 0.88 mm; WH/LH 0.95; DH/LH 0.64; EV/HE 0.69; EV/WF 0.61; WF/HE 1.13; WH/WF 1.75; OOL/WOT 1.15; DM/LM 0.42; FL/FW 2.21; HFL/HFW 2.78; A3 L/W 1.33; 2R1 L/W 3.11.

Type Material. Holotype ♀. Hawai‘i: Ahumoa crater, 7,000 ft [2,130 m], 18 May 1966, J.W. Beardsley, BPBMENT 0000018100.

Etymology. From the Hawaiian *kūmole*, rounded, referring to the wide, deep head with weak posterior corners.

Distribution. Known only from the holotype, collected at Ahumoa in 1966.

***Sierola kumukumu* n. sp.**

Figure 51, Map 11

Island. Hawai‘i.

Diagnosis. Recognized by having the clypeus dorsally with a rounded carina and evenly curved in profile, mandible reddish brown to orange and narrow, and basal wing cells nearly glabrous. Although not especially distinctive in appearance, this combination of characters will distinguish it from all other species. The coarse sculpting of the lower gena is also unusual.

Description. **Female**. *Head*. Clypeal process semicircular, apex broadly rounded; dorsally with a rounded carina or a broad, rounded ridge; in profile evenly curved from base to apex, apical angle slightly acute. Mandible narrow, more or less parallel-sided except at base; apical half of mandible strongly convex outwardly, teeth arrayed on frontal and dorsal surfaces, outwardly coriaceous, somewhat dull; in ventral view evenly, moderately curved. Apex of mandible vertical, with teeth distinctly stronger ventrally. Malar space very small. Dorsal setae of head distinctly longer than flagellar width. Frons moderately punctate, about 2–3 pit widths apart. Vertex and gena setae distinctly longer than frons setae but only about as thick, not particularly conspicuous. Frons microsculpture evident but smooth, shining (rarely nearly absent, shining). Gena sculpture minutely, coarsely areolate. Vertex in dorsal view more or less straight, corners strongly rounded off; occipital margin narrowly rounded. Lateral ocelli distinctly separate from vertex crest by less than ocellus length. Ocellar triangle front angle weakly acute. Head more or less parallel-sided for some distance posterior to eyes. Dorsum of head in lateral view slightly convex, head deepest on line through posterior margin of eye. Venter of head posterior to mandible convex in lateral view, with relatively sparse setae. Head weakly convex ventrally, genal angle absent. Postgenal depression absent. Antenna extending to posterior margin of pronotum.

Mesosoma. Anterior margin of dorsal pronotal area in lateral view evenly rounded. Pronotal setae longer than flagellar width. Propodeal disc laterally coarsely striate; metapleural carinae complete. Fore femur only moderately expanded, more than twice as long as wide, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with faint microsculpture laterally. Sixth sternum evenly covered with short, anteriorly-directed setae.

Color. Body entirely dark brown to black. Antenna entirely dark brown except ventral side of basal segments yellowish. Mandible reddish brown to orange. Coxae and femora dark brown to black, trochanters and tibiae tinged with brown, tarsi yellow.

Wings. Membrane hyaline. Basal cells of fore wing nearly glabrous, with only few scattered setae.

Measurements. LFW 2.06 mm; LM 1.05 mm; WH/LH 0.86 (0.83–0.87); DH/LH 0.56 (0.54–0.57); EV/HE 0.76 (0.66–0.76); EV/WF 0.68 (0.61–0.72); WF/HE 1.11 (1.01–1.11); WH/WF 1.76 (1.74–1.83); OOL/WOT 1.18 (1.11–1.25); DM/LM 0.42; FL/FW 2.15 (2.14–2.38); HFL/HFW 2.36 (2.36–2.55); A3 L/W 1.33 (1.20–1.43); 2R1 L/W 2.43. N = 8.

Type Material. Holotype ♀. Hawai‘i: Pōhakuloa, 1,800 m, 2 May 1966, J.W. Beardsley, BPBMENT 0000018101. Paratypes: 3♀, Humu‘ula, *Myoporum*, 31 Jul 1935, R.L. Usinger, BPBM. 1♀, Humu‘ula, *Sophora*, 9 Aug 1935, R.L. Usinger, BPBM. 1♀, near Humu‘ula, *Sophora*, 3 Aug 1946, E.C. Zimmerman, BPBM. 4♀, same data, 7 Aug 1946, BPBM. 1♀, Pōhakuloa, 15 Aug 1964, J.W. Beardsley, BPBM. 1♀, Ahumoa crater, 7,000 ft [2,130 m], 18 May 1966, J.W. Beardsley, BPBM. 1♀, Pōhakuloa, on *Chenopodium*, 17 Jun 1966, J.W. Beardsley, BPBM. 1♀, Pōhakuloa, 6,000 ft [1,830 m], 18 Jun 1966, J.W. Beardsley, BPBM. 4♀ 1♂, Pōhakuloa, 21 Jun 1966, J.W. Beardsley, BPBM. 8♀, Pōhakuloa, 1,800 m, 25 Jun 1966, J.W. Beardsley, BPBM. 1♀, Pōhakuloa, 3,800 ft [1,160 m; incorrect elevation], 29 Jun 1966, J.W. Beardsley, BPBM. 1♀, Pōhakuloa, 8,000 ft [2,440 m; elevation appears to be incorrect], 16 Jan 1975, S.L. Montgomery, BPBM. 1♀, Pōhakuloa, 8,100 ft [2,470 m; elevation incorrect?], in *Sicyos* flower, 28 Aug 1979, S.L. Montgomery, BPBM. 3♀, Mauna Kea, Pu‘u La‘au, 2,200–2,300 m, Site 2, Trans. 3, Sta. 3, Tree NA04 87–14, 11 Dec 1987, W.C. Gagné & SLM, BPBM.

Etymology. From the Hawaiian *kumukumu*, stubble, referring to the appearance of the coarse sculpture of the gena in contrast to the smooth frons.

Distribution. Restricted to the Pōhakuloa–Humu‘ula saddle region between Mauna Kea and Mauna Loa. Last collected in 1987.

Discussion. Three collections from Pōhakuloa appear to have the incorrect elevation – one is said to be from 3,800' (1,160 m), well below any part of Pōhakuloa (the correct elevation is probably 5800'), while two are supposedly from above 2400 m, which is barren lava far from any road or trail.

***Sierola lalahu* n. sp.**

Figure 52, Map 11

Island. Hawai‘i [?].

Diagnosis. A large species with the head ventrally angulate and mandible broad with a large ventral tooth, the dorsal teeth reduced. Related to *S. distinctella* n. sp., *S. ihupehu* n. sp., *S. pili* n. sp., and *S. oahuensis* of O‘ahu, but immediately recognizable by the bulbous, strongly convex clypeus. The mandible is also somewhat strongly convex in the middle, but not at the apex.

Description. **Female**. *Head*. Clypeal process bulbous, swollen apically and narrowed at base, apex rounded; dorsally rounded, convex, lacking a carina (frons distinctly depressed above clypeus); in profile elongate, flat at base, evenly curved on apical half. Mandible broad, not narrowed from base, ventral margin nearly straight; slightly twisted at apex, basal portion swollen and strongly convex outwardly, outwardly shining but with distinct, fine microsculpture; in ventral view evenly, moderately curved. Apex of mandible strongly oblique, with a sin-

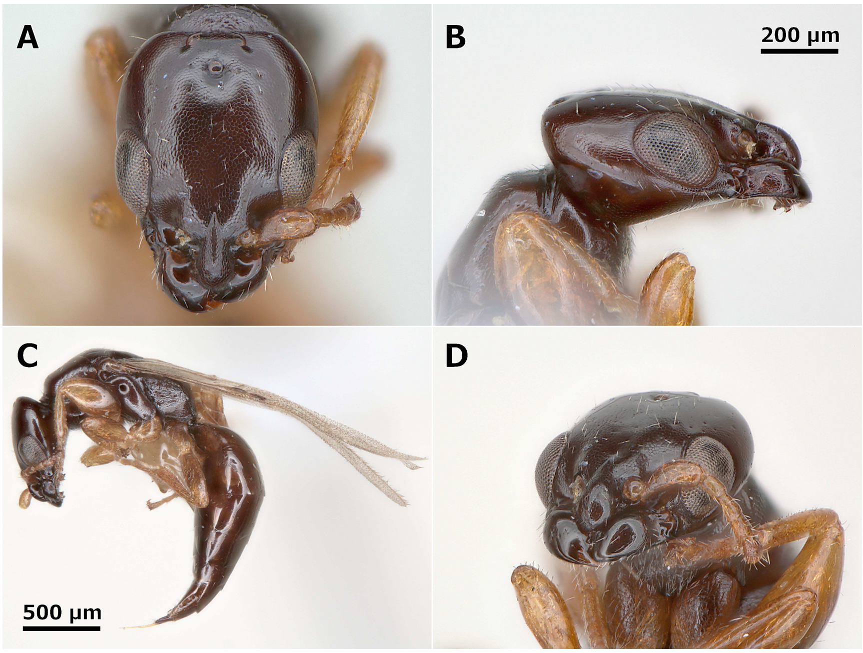


Figure 52. *Sierola lalahu*. A: head, dorsal. B: head, lateral. C: lateral habitus. D: head, frontal.

gle large ventral tooth and a few small teeth on inner margin. Malar space 1/2 as long as width of base of mandible. Dorsal setae of head shorter than flagellar width. Frons with sparse, scattered punctures, mostly 3 pit widths apart or more. Vertex and gena setae similar to and only slightly longer than setae of frons. Frons microsculpture evident but smooth, shining. Vertex in dorsal view very slightly concave; occipital margin not carinate but forming a pronounced ridge. Lateral ocelli nearly touching vertex crest. Ocellar triangle front angle weakly to strongly acute. Head narrowed posterior to eyes. Dorsum of head in lateral view slightly convex, head deepest on line well posterior of eye. Venter of head posterior to mandible flat in lateral view, nearly glabrous. Genal angle prominent, apex rounded, head distinctly triangular in lateral view. Gena ventral to eye flat. Postgenal depression deep, distinct, V-shaped.

Mesosoma. Anterior margin of dorsal pronotal area in lateral view evenly rounded, pronotal disc slightly concave. Pronotal setae short, inconspicuous. Propodeal disc laterally coarsely rugulose; metapleural carinae complete. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with faint microsculpture laterally (some very faint microreticulation medially on T3). Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Body entirely dark brown to black. Antenna yellow-brown. Mandible black. Legs yellowish brown.

Wings. Membrane tinged with yellow. Basal cells of fore wing nearly glabrous, with only few scattered setae. Cell 1M weakly convex posteriorly, corner posteroapical.

Measurements. LFW 2.31 mm; LM 1.07 mm; WH/LH 0.77; DH/LH 0.53; EV/HE 1.07; EV/WF 0.77; WF/HE 1.39; WH/WF 1.59; OOL/WOT 1.69; DM/LM 0.42; FL/FW 1.95; HFL/HFW 2.53; A3 L/W 1.34; 2R1 L/W 3.14.

Type Material. Holotype ♀. Fauna Hawaiiensis collection, R.C.L. Perkins, BPBMENT 0000018102.

Etymology. From the Hawaiian *lalahū*, convex or swollen, referring to the unique bulbous clypeus.

Distribution. Very rare, known only from the holotype (but see comments below).

Discussion. The label on the type says only "Fauna Hawaiiensis collection" with no date or locality information, or a Perkins code number. I believe it is from Hawai‘i island because early in this project, a specimen matching this species was collected on a yellow sticky card at Kīpuka Kī, Hawaii Volcanoes National Park, in 2003. Unfortunately the latter specimen cannot be found to confirm with certainty, but the description recorded at the time matches the specimen on hand in the clypeus, mandible, head setation, and malar space, and no others with the distinct strongly convex clypeus have been seen from any island.

***Sierola larifuga* Evans, 1978**

Map 11

Sierola larifuga Evans, 1978: 223.

Island. Hawai‘i, Maui, O‘ahu, Northwest Hawaiian Islands (Midway). Also found in California.

Diagnosis. Fitting among the large group of species with a sharp, evenly curved clypeal carina and densely setose basal wing cells. Not particularly distinctive but easily recognized by the combination of the frons narrow (WF/HE 0.99–1.07), dull and granular with dense punctation between the eyes, A3 short (as wide or wider than long), fore femora expanded (FL/FW 1.75–2.00) and apex usually pale, and metasoma smooth and polished except at the lateral margins of terga. There is also a line of distinct tesselate microsculpture from the posterior eye margin to the vertex crest, which is common in Australian species but virtually absent in Pacific *Sierola*. Among Hawai‘i island species, closest to *S. perkinsi* Fullaway, which has the frons microsculpture distinctly smooth, and *S. indecora* Fullaway which has the femora all dark and usually narrower, and vertex and gena setae elongate.

Material examined: 2♀, Koai‘a Reserve, Kohala Mts., 3,000 ft [900 m; however the lowest elevation of the reserve is 960 m], ex *Acacia koaia*, 10 Feb 1971, J.W. Beardsley, BPBM. 2♀, Kohala Mts., *Acacia koa*, 14 May 1973, J.W. Beardsley, BPBM. 1♀, Kohala Mts., 3,200 ft [980 m], 12 Dec 1973, J.W. Beardsley, BPBM. 1♀, Waimea, Howard Hall's lime orchard, 2,440 ft [740 m], Trap 361 (Solulys), 22-29 Jun 2005, L. Leblanc, UHIM. 1♀, Waimea, Howard Hall's lime orchard, 2440 ft [740 m], Trap 356 (Solulys), 13-20 Jul 2005, L. Leblanc, UHIM. 1♀, Stainback Hwy, USDA-ARS Citrus Orchard, 550 ft [170 m], Trap 223 (Methyl Eugenol), 28 Jun-5 Jul 2005, L. Leblanc, UHIM. 1♀, Saddle Road Mile 9, open bog, 2,200 ft [670 m], Trap 397 (Dead Flies), 30 Jun-9 Jul 2005, L. Leblanc, UHIM. 1♀, Pu‘u Wa‘awa‘a, Wildlife Sanctuary Boundary, 4,000 ft [1,220 m], 19.7410°N 155.8493°W, beating *Myoporum*, 15 Aug 2012, K.N. Magnacca, KNMC.

Distribution. Taken infrequently but widely in a variety of habitats on O‘ahu, Maui, Hawai‘i, and Midway Atoll, including agricultural fields, disturbed coastal and lowland vegetation, and montane native forest. On Hawai‘i, it has mainly been collected on the northern portion of the island.

Discussion. This introduced species was treated and redescribed in Magnacca (2020). As noted there, it is probably native to Australia.

***Sierola laticeps* Fullaway, 1920**

Figure 53, Map 12

Sierola laticeps Fullaway, 1920: 92.

Island. Hawai‘i.

Diagnosis. Belonging in the group of species with a highly arched, thin clypeal carina, strong, conspicuous vertex and gena setae, and densely punctate frons. Readily distinguished from all others by the very deep head (DH/LH 0.65–0.69) which is strongly produced ventrally, as well as the strongly acute ocellar triangle and carinate occipital margin. Closest to *S. longiceps* Fullaway; some specimens of that species have the head angled ventrally, but they are always narrower and not as deep (WH 0.75–0.82, DH/LH 0.55–0.61).

Description. **Female**. *Head*. Clypeal process triangular to rounded triangular, apex pointed to rounded; dorsally with a thin, laminar carina, the sides strongly concave; in profile strongly arched, vertical or slightly recurved at apex, carina extending above antennal sockets. Mandible narrow, more or less parallel-sided except at base; not twisted, at most weakly convex outwardly, outwardly coriaceous, somewhat dull; in ventral view evenly, moderately curved. Apex of mandible vertical, with teeth distinctly stronger ventrally. Malar space 1/4

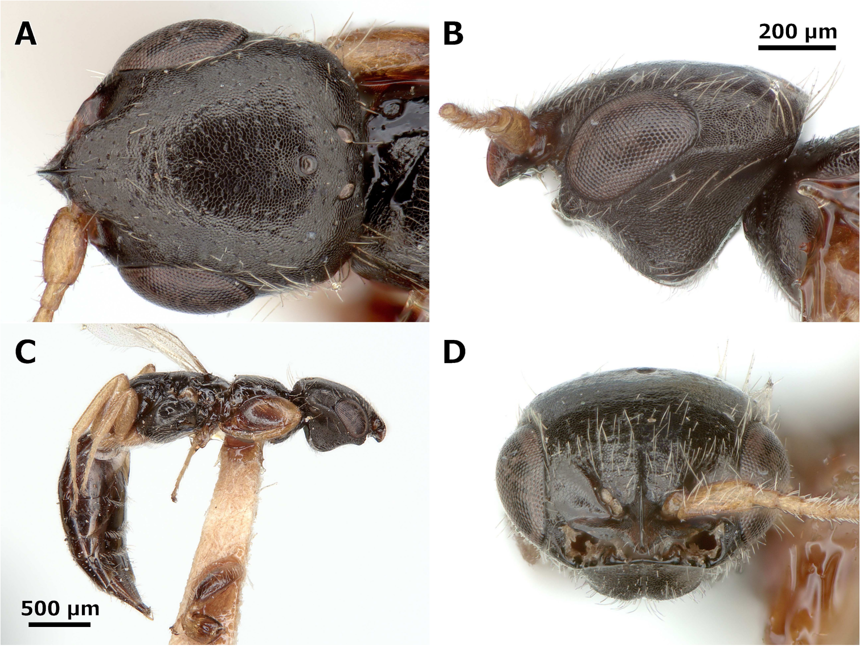


Figure 53. *Sierola laticeps*. A: head, dorsal. B: head, lateral. C: lateral habitus. D: head, frontal.

as long as width of base of mandible. Dorsal setae of head about twice as long as flagellar width or more. Frons with shallow, close punctures, mostly about 1 pit width apart. Vertex and gena setae conspicuous, nearly twice as long as setae of frons and stronger, erect and directed anterior. Frons microsculpture dull, granular. Vertex in dorsal view more or less straight, corners somewhat squared; occipital margin carinate. Lateral ocelli distinctly separate from vertex crest by less than ocellus length. Ocellar triangle front angle strongly acute. Head narrowed posterior to eyes. Dorsum of head in lateral view slightly convex, head deepest on line through eye. Venter of head posterior to mandible concave in lateral view, with relatively sparse setae. Genal angle prominent, apex rounded, head distinctly triangular in lateral view. Gena ventral to eye concave. Postgenal depression narrow but distinct, V-shaped.

Mesosoma. Anterior margin of dorsal pronotal area in lateral view evenly rounded. Pronotal setae longer than flagellar width. Propodeal disc laterally coarsely striate; metapleural carinae complete. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with faint microsculpture laterally.

Color. Body entirely dark brown to black. Antenna yellow-brown. Mandible black. Fore coxa and femur black, legs otherwise yellow.

Wings. Membrane tinged with yellow. Basal cells of fore wing densely and conspicuously setose.

Measurements. LFW 2.45 mm; LM 1.41 mm; WH/LH 0.89 (0.85–0.91); DH/LH 0.67 (0.63–0.71); EV/HE 0.79 (0.64–0.79); EV/WF 0.59 (0.51–0.61); WF/HE 1.33 (1.23–1.33); WH/WF 1.48 (1.48–1.57); OOL/WOT 1.75 (1.62–1.85); DM/LM 0.35; FL/FW 2.04 (1.86–2.04); HFL/HFW 2.52 (2.42–2.65); A3 L/W 1.43 (1.27–1.57). N = 13.

Type Material. Holotype ♀. Hawai‘i: Hilo, 1,500 ft [460 m], 3 Aug 1906, W.M. Giffard, BPBMENT 0000000041.

Material examined: 1♀, Kīlauea, [no date], T. Blackburn, BPBM. 6♀, Hawai‘i, [no date], A. Koebele, HDOA (paratypes; one with a cocoon but no specimen). 1♀, Hualālai, 5,000 ft [1,520 m], 5 Aug

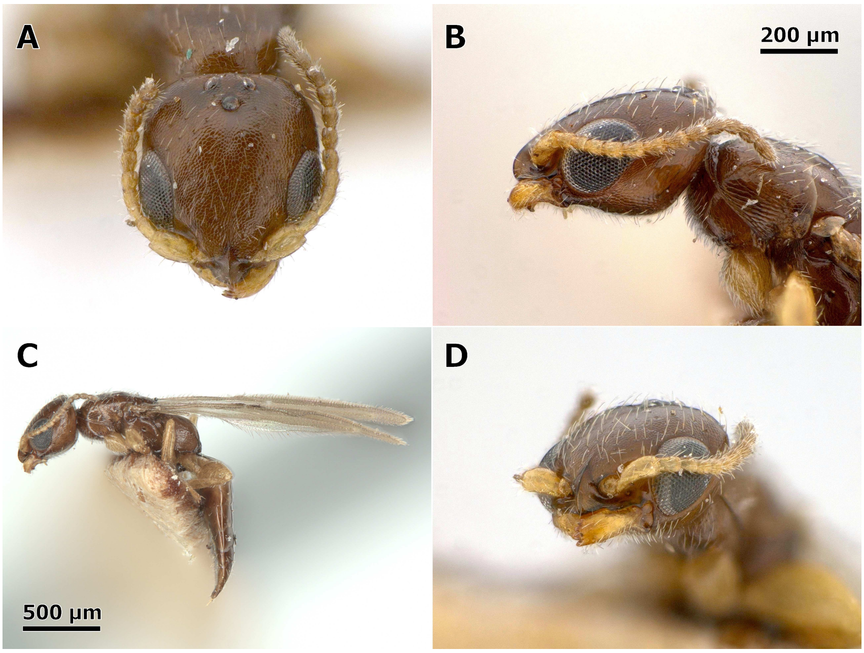


Figure 54. *Sierola lepida*. A: head, dorsal. B: head, lateral. C: lateral habitus. D: head, frontal.

1892, R.C.L. Perkins, NHMUK 013380257. 1♀, Kīlauea, 4,000 ft [1,220 m], Aug 1896, A. Koebele, BPBM. 1♀, Kīlauea, Aug 1896, R.C.L. Perkins, BPBM. 1♀, Kīlauea, 684, Dec 1896, R.C.L. Perkins, USNM. 1♀, Kīlauea, edge of koa forest, 24 May 1905, F.W. Terry, BPBM (paratype). 4♀, Kīlauea, koa forest, 3 Jun 1905, F.W. Terry, BPBM (paratypes). 1♀, Kīlauea, Jul 1906, R.C.L. Perkins, BPBM. 1♀, Kīlauea, dead koa forest, 19 Jul 1911, W.M. Giffard, BPBM (paratype). 1♀, Kahuku, 15 Jan 1917, W.M. Giffard & F. Muir, BPBM (paratype). 1♀, Ka‘ū Road, 16 Jan 1917, W.M. Giffard & F. Muir, BPBM (paratype). 1♀, Pu‘u Wa‘awa‘a, 3,700 ft [1,130 m], Aug 1917, W.M. Giffard, BPBM (paratype). 1♀, Kīlauea, 4,000 ft [1,220 m], dry forest, 9 Jan 1919, W.M. Giffard, UCRC (paratype). 1♀, Steam Crack, Kīlauea, 3,800 ft [1,160 m], 6 Sep 1919, W.M. Giffard, UCRC. 1♀, Kīlauea, 4,000 ft [1,220 m], old crack, 8 Sep 1919, W.M. Giffard, BPBM. 2♀, Kīlauea, 4,000 ft [1,220 m], 9 Sep 1919, F.X. Williams, BPBM. 4♀ 1♂, Kīlauea, 4,000 ft [1,220 m], 2 Aug 1920, W.M. Giffard, BPBM. 1♀, Kīlauea, 4,000 ft [1,220 m], dry forest, 18 Aug 1920, W.M. Giffard, BPBM. 1♀, Hualālai, 5,000 ft [,1520 m], 5 Aug 1892, R.C.L. Perkins, NHMUK. 1♀ 1♂, Pu‘u Wa‘awa‘a, West Kīleo, 4,300 ft [1,300 m], 19.7345°N 155.8359°W, beating *Santalum paniculatum*, 27 Jan 2012, K.N. Magnacca, KNMC. 1♀, Pu‘u Wa‘awa‘a, West Kīleo, 4,300 ft [1,300 m], 19.7345°N 155.8359°W, beating *Metrosideros polymorpha*, 27 Jan 2012, K.N. Magnacca, KNMC.

Distribution. Found in in dry to mesic forest at Pu‘u Wa'awa‘a, Ka‘ū, and Kīlauea. Notably absent from the Mauna Loa–Mauna Kea saddle area, where *S. longiceps* is most commonly found.

Discussion. The type has the clypeus distinctly triangular and pointed, but many specimens have it rounded triangular with a rounded apex. Otherwise they are identical and from the same habitat. Specimens from Kona have the fore femur slightly narrower, but well within the normal range of variation.

Sierola lepida **Fullaway, 1920**

Figure 54, Map 12

Sierola lepida Fullaway, 1920: 100.

Island. Hawai‘i.

Diagnosis. Part of the species group with a sharp, rather strongly arched clypeal carina, densely setose basal wing cells, and mandible yellow. Closest to *S. imparata* and *S. nihoniho*

n. sp.; distinguished from the former by having the dorsum of head slightly convex in lateral view, frons weakly coriaceous and somewhat shining, A3 about as long as wide or scarcely longer (L/W 1.0–1.2), and fore femur moderately broad (FL/FW 2.00–2.15); and from the latter by having the posterior corners of the head not strongly rounded, and the head not so broad.

Description. **Female**. *Head*. Clypeal process semicircular, apex broadly rounded; dorsally with a sharp carina; in profile strongly arched, vertical or slightly recurved at apex, carina extending above antennal sockets. Mandible moderately narrow, slightly narrowed medially from base, ventral margin weakly concave; not twisted, at most weakly convex outwardly, outwardly coriaceous, somewhat dull; in ventral view evenly, moderately curved. Apex of mandible vertical, with equally strong teeth. Malar space almost absent. Dorsal setae of head about as long as flagellar width or scarcely longer. Frons with shallow punctures, dense near antennae, 2–3 pit widths apart posterior of midpoint of eyes. Vertex and gena setae similar to and only slightly longer than setae of frons. Frons microsculpture coriaceous, matte but without strong surface texture. Vertex in dorsal view more or less straight; occipital margin broadly rounded. Lateral ocelli nearly touching vertex crest. Ocellar triangle front angle strongly to weakly acute. Head rounded shortly posterior to eyes. Dorsum of head in lateral view slightly convex, head deepest on line through posterior margin of eye. Venter of head posterior to mandible convex in lateral view, with relatively sparse setae. Head evenly convex ventrally, genal angle absent. Postgenal depression very shallow, nearly absent. Antenna extending to pronotum.

Mesosoma. Anterior margin of dorsal pronotal area in lateral view evenly rounded. Pronotal setae about as long as flagellar width or scarcely longer. Propodeal disc laterally finely, weakly striate; metapleural carinae present posteriorly, fading anteriorly. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Highly polished, without a trace of microsculpture. Sixth sternum broadly glabrous medially, with sparse setae laterally.

Color. Body entirely dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible yellow. Legs all yellow.

Wings. Membrane tinged with yellow. Basal cells of fore wing densely and conspicuously setose.

Measurements. LFW 1.87 mm; LM 0.88 mm; WH/LH 0.88 (0.86–0.88); DH/LH 0.58 (0.58–0.59); EV/HE 0.76 (0.76–0.81); EV/WF 0.63 (0.63–0.74); WF/HE 1.21 (1.10–1.21); WH/WF 1.65 (1.65–1.76); OOL/WOT 1.47 (1.42–1.50); DM/LM 0.40; FL/FW 2.00 (1.94–2.14); HFL/HFW 2.18 (2.18–2.53); A3 L/W 1.08 (1.06–1.21). N = 3.

Type Material. Holotype ♀. Hawai‘i: Glenwood, 2,800 ft [850 m], 1 Oct 1917, W.M. Giffard & F. Muir, BPBMENT 0000000055.

Material examined: 1♀, Kona, 3,000 ft [910 m], Sep 1892, R.C.L. Perkins, USNM. 1♀, Kaumana, 29 Apr 1920, O.H. Swezey, BPBM.

Distribution. Rare in wet forest on both the Hilo and Kona sides; known from only three specimens, last collected in 1920.

Discussion. The original description says that the holotype is black; it is now brown, presumably having faded.

Sierola levigata **Fullaway, 1920**

Figure 55, Map 12

Sierola levigata Fullaway, 1920: 94.

Island. Hawai‘i.

Diagnosis. Part of a large complex of species with a sharp, curved to arched clypeal carina, densely setose basal wing cells, lateral ocelli distinctly separate from the vertex crest, and head deep (DH/LH ≥0.59). Separated by having the frons moderately punctate with coriaceous sculpture (not strongly dull and densely punctate), and vertex and gena

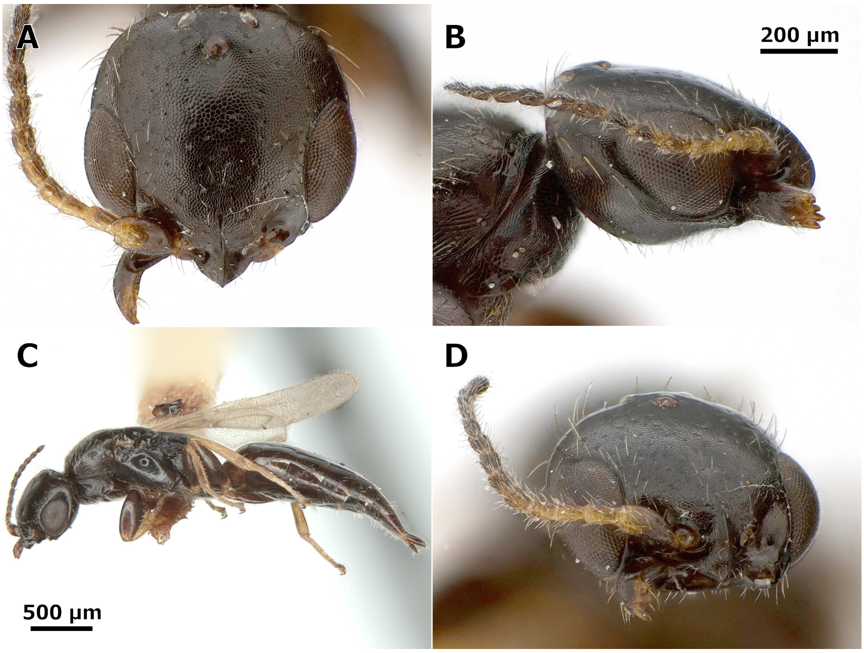


Figure 55. *Sierola levigata*. A: head, dorsal. B: head, lateral. C: lateral habitus. D: head, frontal.

setae elongate and conspicuous. Closest to *S. compacta* Fullaway, distinguished by the broader head (WH/LH 0.94–0.96 vs. ~0.90) and hind femur (HFL/HFW ~2.5 vs. 3.0), and the propodeum more finely sculpted and lacking a median carina. The frons is also usually much wider. Also similar to *S. newelli* Fullaway, distinguished by having A3 distinctly longer than wide (L/W 1.3–1.5) and the hind femur moderately narrow (HFL/HFW ~2.30–2.50).

Description. **Female**. *Head*. Clypeal process rounded triangular, apex pointed; dorsally with a thin, laminar carina, the sides strongly concave; in profile strongly arched, vertical or slightly recurved at apex, carina extending above antennal sockets. Mandible moderately narrow, more or less parallel-sided except at base; not twisted, at most weakly convex outwardly, outwardly coriaceous, somewhat dull; in ventral view evenly, moderately curved. Apex of mandible vertical, with equally strong teeth. Malar space very small. Dorsal setae of head distinctly longer than flagellar width. Frons with distinct, uneven punctures, 1–3 pit widths apart. Vertex and gena setae conspicuous, nearly twice as long as setae of frons and stronger, erect and directed anterior. Frons microsculpture coriaceous, matte but without strong surface texture. Vertex in dorsal view more or less straight; occipital margin broadly rounded. Lateral ocelli distinctly separate from vertex crest by less than ocellus length. Ocellar triangle front angle right. Head rounded shortly posterior to eyes. Dorsum of head in lateral view slightly convex, head deepest on line through posterior margin of eye. Venter of head posterior to mandible convex in lateral view, with relatively sparse setae. Head evenly convex ventrally, genal angle absent. Postgenal depression very shallow, nearly absent. Antenna extending to posterior margin of pronotum.

Mesosoma. Anterior margin of dorsal pronotal area in lateral view evenly rounded. Pronotal setae elongate, twice as long as flagellar width or more. Propodeal disc laterally coarsely striate; metapleural carinae complete. Fore femur only moderately expanded, more than twice as long as wide, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with faint microsculpture laterally. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

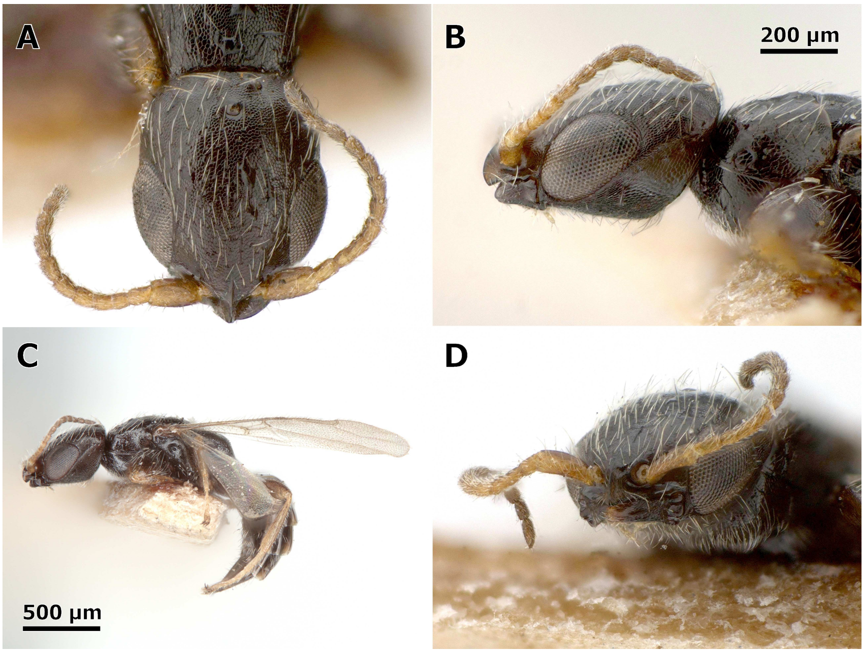


Figure 56. *Sierola longiceps*. A: head, dorsal. B: head, lateral. C: lateral habitus. D: head, frontal.

Color. Body entirely dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible black. Coxae and femora dark brown to black, tibiae, tarsi, and trochanters yellow.

Wings. Membrane hyaline. Basal cells of fore wing densely and conspicuously setose.

Measurements. LFW 2.59 mm; LM 1.32 mm; WH/LH 0.96 (0.94–0.96); DH/LH 0.61 (0.60–0.64); EV/HE 0.67 (0.63–0.68); EV/WF 0.52 (0.52–0.59); WF/HE 1.29 (1.07–1.29); WH/WF 1.63 (1.62–1.79); OOL/WOT 1.31 (1.19–1.31); DM/LM 0.42; FL/FW 2.25 (2.22–2.26); HFL/HFW 2.53; A3 L/W 1.43 (1.36–1.50); 2R1 L/W 2.7. N = 3.

Type Material. Holotype ♀. Hawai‘i: Kīlauea, 4,000 ft [1,220 m], Oct 1915, W.M. Giffard, BPBMENT 0000000044.

Material examined: 1♀, Kīlauea, Jul 1895, R.C.L. Perkins, NHMUK. 1♀, Kīlauea, Aug 1896, R.C.L. Perkins, BPBM.

Distribution. Known only from the holotype, collected in 1915 at Kīlauea, and two older specimens.

Discussion. See comments under *S. fuscipennis*.

***Sierola longiceps* Fullaway, 1920**

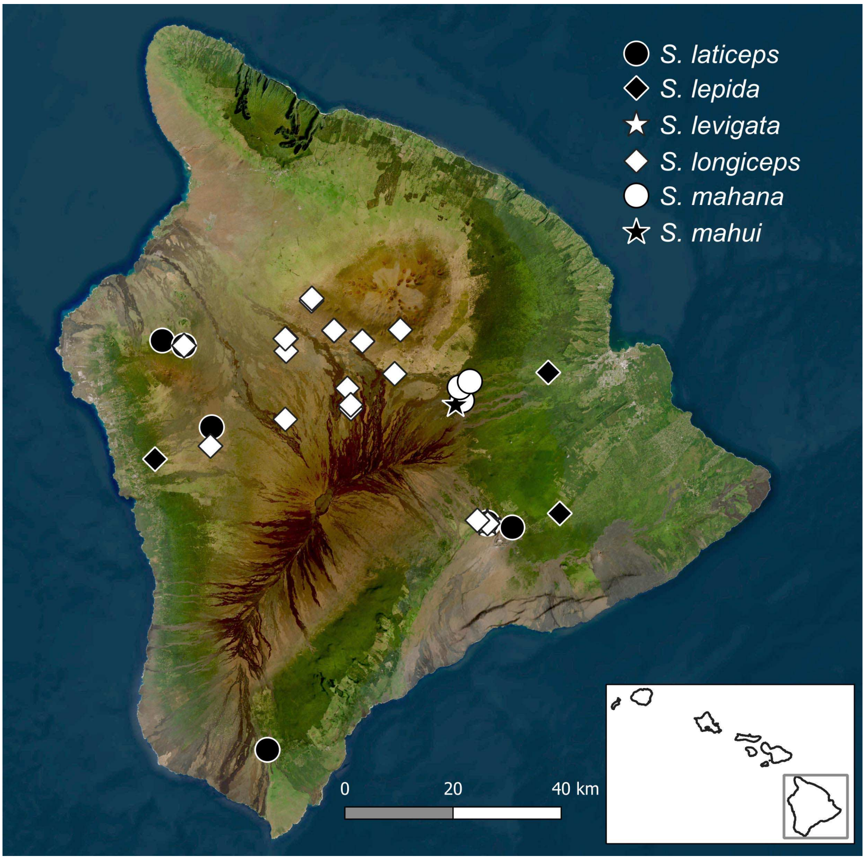
Figure 56, Map 12

Sierola longiceps Fullaway, 1920: 110.

Island. Hawai‘i.

Diagnosis. Belonging in the group of species with a highly arched, thin clypeal carina, strong, conspicuous vertex and gena setae, and densely punctate frons. Separated from related species by the strongly acute ocellar triangle, carinate occipital margin, and narrow and moderately deep head (WH 0.75–0.82, DH/LH 0.55–0.61).

Description. **Female**. *Head*. Clypeal process rounded triangular, apex weakly pointed; dorsally with a thin, laminar carina, the sides strongly concave; in profile strongly arched, vertical or slightly recurved at apex, carina extending above antennal sockets. Mandible



Map 12. Collection localities of *Sierola laticeps, S. lepida, S. levigata, S. longiceps, S. mahana*, and *S. mahui*.

narrow, more or less parallel-sided except at base; not twisted, at most weakly convex outwardly, outwardly coriaceous, somewhat dull; in ventral view evenly, moderately curved. Apex of mandible vertical, with equally strong teeth. Malar space very small. Dorsal setae of head about twice as long as flagellar width or more. Frons with shallow, close punctures, mostly about 1 pit width apart. Vertex and gena setae conspicuous, nearly twice as long as setae of frons and stronger, erect and directed anterior. Frons microsculpture coriaceous, matte but without strong surface texture. Vertex in dorsal view more or less straight; occipital margin carinate. Lateral ocelli nearly touching vertex crest. Ocellar triangle front angle strongly acute. Head more or less parallel-sided for some distance posterior to eyes. Dorsum of head in lateral view slightly convex, head deepest on line through posterior margin of eye. Venter of head posterior to mandible flat in lateral view, with moderately dense pubescence. Head evenly convex ventrally, genal angle absent. Gena ventral to eye flat. Postgenal depression shallow, rounded. Antenna extending to pronotum.

Mesosoma. Anterior margin of dorsal pronotal area in lateral view evenly rounded. Pronotal setae longer than flagellar width. Propodeal disc laterally coarsely striate; metapleural carinae complete. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Highly polished, without a trace of microsculpture. Sixth sternum narrowly glabrous medially, laterally with dense pilose setae.

Color. Body entirely dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible black, reddish at apex before teeth. Coxae and femora dark brown to black, tibiae, tarsi, and trochanters yellow.

Wings. Membrane tinged with yellow. Basal cells of fore wing densely and conspicuously setose.

Measurements. LFW 1.73 mm; LM 0.97 mm; WH/LH 0.79 (0.75–0.82); DH/LH 0.56 (0.53–0.61); EV/HE 0.79 (0.72–0.87); EV/WF 0.79 (0.67–0.84); WF/HE 1.00 (1.00–1.15); WH/WF 1.71 (1.62–1.76); OOL/WOT 1.67 (1.43–1.67); DM/LM 0.46; FL/FW 2.00 (1.78–2.07); HFL/HFW 2.33 (2.29–2.52); A3 L/W 1.00 (1.00–1.57). N = 37.

Type Material. Holotype ♀. Hawai‘i: Kīlauea, 4,000 ft [1,220 m], Oct 1915, W.M. Giffard, BPBMENT 0000000076.

Material examined: 1♀, Kona, 5,000 ft [1,520 m], 30 Jun 1892, R.C.L. Perkins, BPBM. 1♀, Kīlauea, Aug 1896, R.C.L. Perkins, BPBM. 1♀, Kīlauea, 4,000 ft [1,220 m], old crack, 8 Sep 1919, W.M. Giffard, BPBM. 1♀, Humu‘ula, 1 mi N, 30 Jul 1935, R.L. Usinger, BPBM. 7♀ 1♂, Humu‘ula, *Myoporum*, 31 Jul 1935, R.L. Usinger, BPBM. 1♀, Humu‘ula, *Euphorbia*, 31 Jul 1935, R.L. Usinger, BPBM. 1♀, Humu‘ula, 4 Aug 1935, R.L. Usinger, BPBM. 1♀ 2♂, Humu‘ula, *Myoporum*, 5 Aug 1935, R.L. Usinger, BPBM. 1♀, Humu‘ula, *Euphorbia*, 6 Aug 1935, R.L. Usinger, BPBM. 1♀, Pōhakuloa, ex *Chenopodium*, 1 Aug 1946, W.C. Look, BPBM. 3♀, near Humu‘ula, Sophora, 3 Aug 1946, E.C. Zimmerman, BPBM. 1♀, near Humu‘ula, 3 Aug 1946, E.C. Zimmerman, BPBM. 1♀, same data, *Chenopodium*, BPBM. 1♀, same data, *Acacia koa*, BPBM. 4♀, near Humu‘ula, *Sophora*, 7 Aug 1946, E.C. Zimmerman, BPBM. 1♀, same data, *Myoporum*, BPBM. 1♀, [near Humu‘ula? no locality label], *Myoporum*, 7 Aug 1946, E.C. Zimmerman, BPBM. 2♀, Humu‘ula, Pōhakuloa, *Myoporum*, [no date], E.H. Bryan, BPBM. 1♀, Pōhakuloa, 10 Feb 1962, J.W. Beardsley, BPBM. 1♀, Pōhakuloa, 1,800 m, 2 May 1966, J.W. Beardsley, BPBM. 1♀ 1♂, Ahumoa crater, 7,000 ft [2,130 m], 18 May 1966, J.W. Beardsley, BPBM. 2♀ 1♂, Halepōhaku, 9,500 ft [2,900 m], 18 Jun 1966, J.W. Beardsley, BPBM. 2♀, Pōhakuloa, 6,000 ft [1,830 m], 18 Jun 1966, J.W. Beardsley, BPBM. 1♀, Halepōhaku, 9500 ft [2900 m], 18 Jun 1966, J.W. Beardsley, BPBM. 10♀ 2♂, Pōhakuloa, 1,800 m, 21 Jun 1966, J.W. Beardsley, BPBM. 1♀, Ahumoa crater, 6,500 ft [1,980 m], 21 Jun 1966, J.W. Beardsley, BPBM. 14♀ 2♂, Pōhakuloa, 1,800 m, 25 Jun 1966, J.W. Beardsley, BPBM. 1♀, Pōhakuloa, 1,800 m, 29 Jun 1966, J.W. Beardsley, BPBM. 1♀ 3♂, Mauna Loa above Pōhakuloa, 7,300 ft [2,230 m], on *Myoporum*, 12 Jan 1973, D.E. Hardy, BPBM. 1♀, Mauna Loa Strip Road, 4,300 ft [1,300 m], D-Vac sample ex *Acacia koa*, 13 Oct 1973, J. Leeper, BPBM. 2♀, Pōhakuloa, 8,000 ft [2,440 m], 16 Jan 1975, S.L. Montgomery, BPBM. 1♀, Pōhakuloa, 6,600 ft [2,010 m], ex *Chenopodium oahuense*, 9 May 1986, J.W. Beardsley, BPBM. 2♀, Pu‘u Wa‘awa‘a, West Kīleo, 4,300 ft [1,300 m], 19.7345°N 155.8359°W, beating *Metrosideros polymorpha*, 27 Jan 2012, K.N. Magnacca, KNMC.

Distribution. Abundant in dry forest in the Pōhakuloa–Humu‘ula saddle region and Pu‘u Wa'awa‘a, rare around Kīlauea. At the latter two it overlaps with *S. laticeps*.

Discussion. This species appears to be a have a wider range of variation than most others. Larger specimens have the fore femora broader and the head deeper and distinctly angulate in lateral view: FL/FW 1.79–1.93, DH/LH 0.57–0.61, compared to 1.93–2.07 and 0.53–0.58 in smaller specimens with the gena rounded. Intermediates connect the two forms in both the ventral head shape and dimensions, and no other characters appear to separate them. The large form overlaps with *S. pilosa* Fullaway of Moloka‘i and there are no clear characters to separate them, but I have chosen to retain *S. longiceps* as a distinct species for now until the full variation can be understood across all islands. The near-restriction of this species to the Mauna Loa–Mauna Kea saddle area, with the related *S. laticeps* primarily around Kīlauea, also argues against the Hawai‘i specimens being part of a widespread multi-island taxon. The four specimens from Kīlauea have the head on the flat end, but two have the femora very broad.

***Sierola mahana* n. sp.**

Figure 57, Map 12

Island. Hawai‘i.

Diagnosis. Part of a large complex of species with a sharp, curved to arched clypeal carina, densely setose basal wing cells, and lateral ocelli distinctly separate from the vertex

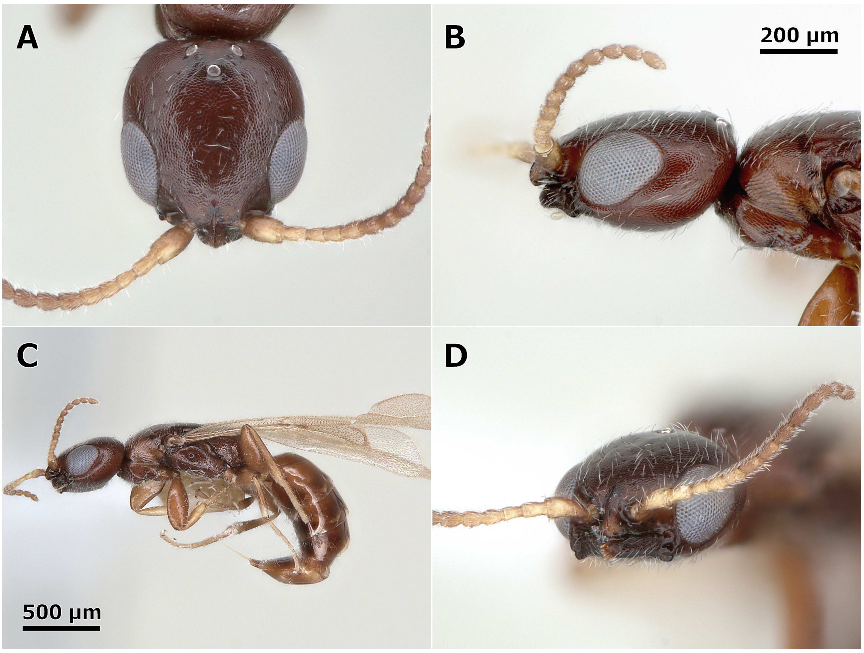


Figure 57. *Sierola mahana*. A: head, dorsal. B: head, lateral. C: lateral habitus. D: head, frontal.

crest. Separated from most other species by having the head more compressed (DH/LH 0.55–0.58) and ocellar triangle weakly obtuse, OOL/WOT 1.25–1.45. The vertex and gena setae are also short, similar to those of the frons. Closest to *S. nemorensis* Fullaway, separated by having the antenna longer (A3 about 1.3–1.5 times as long as wide), mandible parallel-sided beyond the basal constriction, and basal wing cells clearly densely setose.

Description. **Female**. *Head*. Clypeal process semi-elliptical, apex broadly rounded; dorsally with a sharp carina; in profile evenly curved from base to apex, apical angle slightly acute (slightly recurved ventrally). Mandible moderately narrow, more or less parallel-sided except at base; apical half of mandible strongly convex outwardly, teeth arrayed on frontal and dorsal surfaces, outwardly coriaceous, somewhat dull; in ventral view evenly, moderately curved. Apex of mandible vertical, with teeth distinctly stronger ventrally. Malar space very small. Dorsal setae of head about as long as flagellar width or scarcely longer. Frons with shallow punctures, dense near antennae, 2–3 pit widths apart posterior of midpoint of eyes. Vertex and gena setae similar to and only slightly longer than setae of frons. Frons microsculpture finely microreticulate, surface weakly matte. Vertex in dorsal view more or less straight; occipital margin broadly rounded. Lateral ocelli distinctly separate from vertex crest by less than ocellus length. Ocellar triangle front angle right. Head more or less parallel-sided for some distance posterior to eyes. Dorsum of head in lateral view slightly convex, head deepest on line through posterior margin of eye. Venter of head posterior to mandible convex in lateral view, with relatively sparse setae. Head weakly convex ventrally, genal angle absent. Postgenal depression very shallow, nearly absent. Antenna extending to posterior margin of pronotum.

Mesosoma. Anterior margin of dorsal pronotal area in lateral view evenly rounded. Pronotal setae about as long as flagellar width or scarcely longer. Propodeal disc laterally finely, weakly striate; metapleural carinae present posteriorly, fading anteriorly. Fore femur only moderately expanded, more than twice as long as wide, strongly laterally compressed, slightly arcuate in dorsal view.

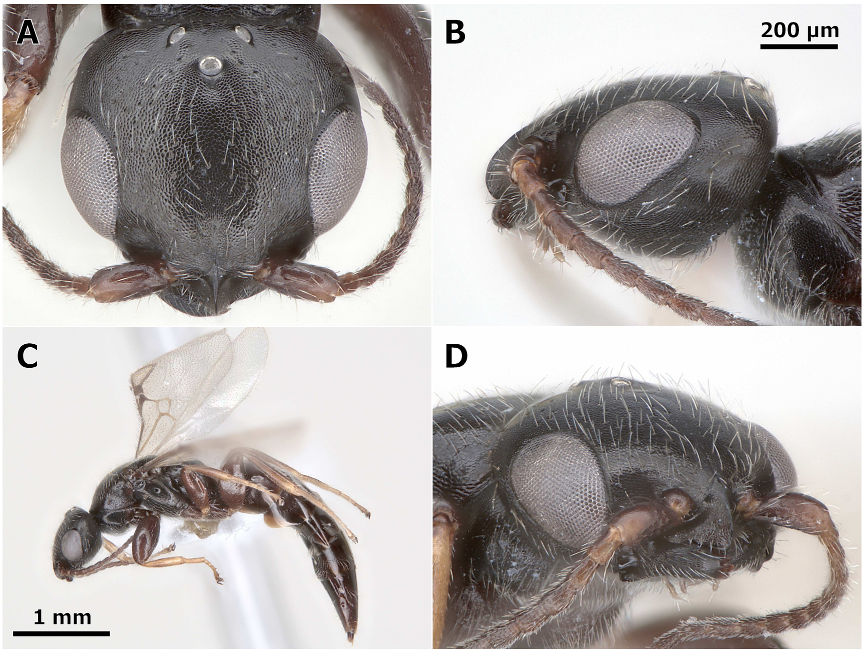


Figure 58. *Sierola mahui*. A: head, dorsal. B: head, lateral. C: lateral habitus. D: head, frontal.

Metasoma. Shining, with very faint microreticulation over posterior terga. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Body entirely dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible black. Coxae and femora dark brown to black, fore tibia and tarsi yellow, mid and hind tibiae brown with yellow bands at bases and apices.

Wings. Membrane tinged with yellow. Basal cells of fore wing densely and conspicuously setose. Cell 1M weakly convex posteriorly, corner posteroapical.

Measurements. LFW 1.99 mm; LM 0.93 mm; WH/LH 0.90 (0.89–0.91); DH/LH 0.58 (0.55–0.58); EV/HE 0.76 (0.75–0.79); EV/WF 0.67 (0.65–0.67); WF/HE 1.14 (1.14–1.18); WH/WF 1.74 (1.71–1.74); OOL/WOT 1.36 (1.31–1.36); DM/LM 0.40; FL/FW 2.13 (2.13–2.24); HFL/HFW 2.50 (2.43–2.57); A3 L/W 1.43 (1.30–1.43); 2R1 L/W 2.81. N = 3.

Type Material. Holotype ♀. Hawai‘i: Upper Waiākea Forest Reserve, kīpuka 33, clip *M. polymorpha*, 28 Jul 2010, D. Leopold & B. Hwang, BPBMENT 0000018103. Paratypes: 1♀, Upper Waiākea FR, kīpuka 5, 1632 m, 19.6649°N 155.3522°W, ‘ōhi‘a canopy branch clipping, collection 485, lot H.R.0157, 29 Apr 2013, P. LoCicero & C. Morrison, BPBM. 1♀, Upper Waiākea FR, kīpuka 18, 1,532 m, 19.6748°N 155.3342°W, ‘ōhi‘a canopy branch clipping, collection 515, lot H.R.0107, 7 May 2013, P. LoCicero & C. Morrison, USNM.

Etymology. From the Hawaiian *māhana*, twin, referring of the close similarity of this species to *S. nemorensis*.

Distribution. Known from a series of specimens collected in the Mauna Loa kīpuka mosaic, all taken by canopy branch clipping.

Sierola mahui n. sp.

Figure 58, Map 12

Island. Hawai‘i.

Diagnosis. Among species with a sharp clypeal carina and sparsely setose basal wing cells, easily recognized by the very broad head, as wide or wider than long. Similar in general appearance to *S. kauensis* Fullaway, including the very broad fore femur, but differing in the sparsely setose wing cells, lacking a distinct genal angle or postgenal depression, vertex and gena setae undifferentiated from those of the frons, and the lateral ocelli distinctly separated from the vertex crest. Nearly identical to *S. uluna* n. sp., separated by the relatively narrow fore femur, clypeus strongly recurved in profile, and metasoma with faint microreticulation on the entire dorsal surface, more conspicuous ventrally.

Description. **Female**. *Head*. Clypeal process rounded triangular, apex weakly pointed; dorsally with a thin, laminar carina, the sides strongly concave; in profile weakly sloping dorsally but strongly rounded and recurved at apex. Mandible moderately narrow, more or less parallel-sided except at base; apical half of mandible strongly convex outwardly, teeth arrayed on frontal and dorsal surfaces, outwardly coriaceous, somewhat dull; in ventral view evenly, moderately curved. Apex of mandible vertical, with teeth distinctly stronger ventrally. Malar space 1/4 as long as width of base of mandible. Dorsal setae of head about as long as flagellar width or scarcely longer. Frons with shallow, uneven punctures, 1–3 pit widths apart. Vertex and gena setae distinctly longer than frons setae but only about as thick, not particularly conspicuous. Frons microsculpture coriaceous, matte but without strong surface texture. Vertex in dorsal view more or less straight; occipital margin broadly rounded. Lateral ocelli distinctly separate from vertex crest by less than ocellus length. Ocellar triangle front angle weakly acute. Head rounded shortly posterior to eyes. Dorsum of head in lateral view slightly convex, head deepest on line through posterior margin of eye. Venter of head posterior to mandible convex in lateral view, with moderately dense pubescence. Head strongly convex ventrally, genal angle absent. Postgenal depression absent. Antenna extending to mesonotum.

Mesosoma. Anterior margin of dorsal pronotal area in lateral view almost evenly sloping, weakly curved. Pronotal setae longer than flagellar width. Propodeal disc laterally shining, with weak microsculpture; metapleural carinae nearly absent, visible only beyond propodeal declivity. Fore femur only moderately expanded, more than twice as long as wide, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with very faint microreticulation over posterior terga. All sterna and ventral portions of terga almost entirely microreticulate. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Body entirely dark brown to black. Antenna brown, scape yellowish on median face. Mandible black. Coxae and femora brown, trochanters and tibiae tinged with brown, tarsi yellow.

Wings. Membrane tinged with yellow. Basal cells of fore wing sparsely setose, with one or two rows of setae in each cell. Cell 1M weakly convex posteriorly, corner posteroapical.

Measurements. LFW 3.14 mm; LM 1.50 mm; WH/LH 1.04; DH/LH 0.64; EV/HE 0.52; EV/WF 0.39; WF/HE 1.33; WH/WF 1.52; OOL/WOT 1.23; DM/LM 0.46; FL/FW 2.23; HFL/HFW 2.18; A3 L/W 1.40; 2R1 L/W 2.83.

Type Material. Holotype ♀. Hawai‘i: Upper Waiākea FR, kīpuka 40, 1,729 m, canopy Malaise trap, collection K40-C-M, lot HI-1950, 10 Aug 2009, J. Riley & E. Parissenti, BPBMENT 0000018104.

Etymology. From the Hawaiian *māhu‘i*, mimic, referring to the close similarity between this species and *S. uluna* n. sp.

Distribution. Known only from the holotype, collected in wet forest above Hilo.

***Sierola mahuna* n. sp.**

Figure 59, Map 13

Island. Hawai‘i.

Diagnosis. The unusual scutellate sculpture of the frons, which obscures the punctation, together with the quadrate head shape in dorsal view, glabrous basal wing cells, and short but highly arched and recurved clypeus immediately separates this species from all others. The only Hawaiian species with similar scutellate microsculpture are *S. hou* n. sp., which has the head strongly convex dorsally and clypeus short and steep, and *S. unahi* n.

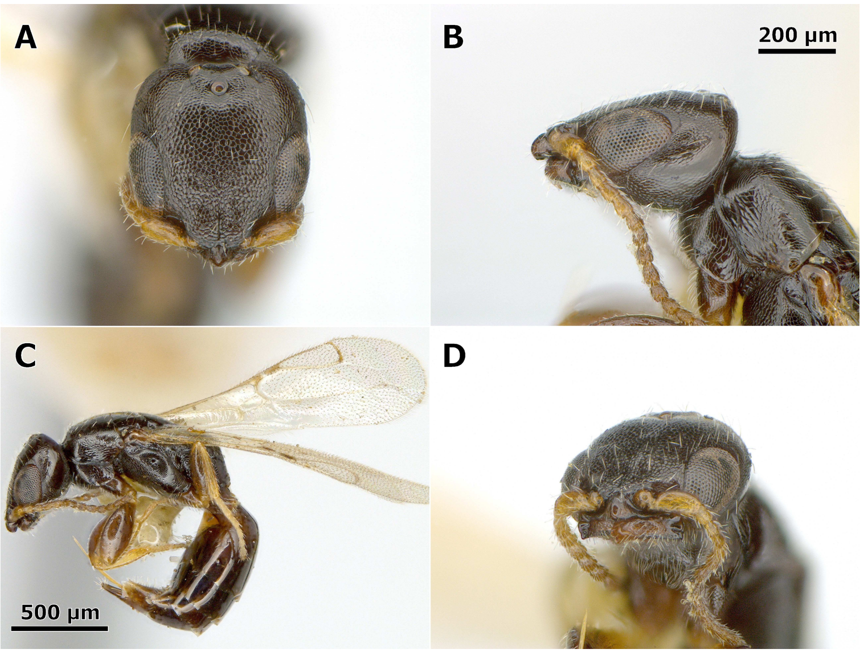


Figure 59. *Sierola mahuna*. A: head, dorsal. B: head, lateral. C: lateral habitus. D: head, frontal.

sp., which has the head distinctly triangular in dorsal view and the clypeus low and elongate.

Description. **Female**. *Head*. Clypeal process rounded triangular, apex weakly pointed; dorsally with a rounded carina dorsally, effaced towards apex; in profile weakly sloping dorsally but strongly rounded and recurved at apex. Mandible moderately narrow, more or less parallel-sided except at base; apical half of mandible strongly convex outwardly, teeth arrayed on frontal and dorsal surfaces, outwardly coriaceous, somewhat dull; in ventral view evenly, moderately curved. Apex of mandible vertical, with teeth distinctly stronger ventrally. Malar space very small. Dorsal setae of head shorter than flagellar width. Frons punctation obscured by microsculpture. Vertex and gena setae similar to and only slightly longer than setae of frons. Frons microsculpture minutely scutellate, cellules shining but separated by conspicuous margins. Vertex in dorsal view very slightly concave; occipital margin broadly rounded. Lateral ocelli nearly touching vertex crest. Ocellar triangle front angle strongly obtuse. Head more or less parallel-sided for some distance posterior to eyes. Dorsum of head in lateral view slightly convex or nearly flat, convex around ocellar triangle, head deepest on line through posterior margin of eye. Venter of head posterior to mandible convex in lateral view, with relatively sparse setae. Head evenly convex ventrally, genal angle absent. Postgenal depression shallow, rounded. Antenna extending to posterior margin of pronotum.

Mesosoma. Anterior margin of dorsal pronotal area in lateral view weakly angulate. Pronotal setae about as long as flagellar width or scarcely longer. Propodeal disc laterally coarsely rugulose; median carina faintly present; transverse carina faintly present, curving on each side; metapleural carinae complete. Fore femur only moderately expanded, more than twice as long as wide, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Highly polished, without a trace of microsculpture. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Body entirely dark brown to black. Antenna entirely dark brown except ventral side of basal segments yellowish. Mandible reddish brown. Coxae and femora dark brown to black, tibiae dark brown, trochanters, tarsi, and bands at bases and apices of tibiae orange.

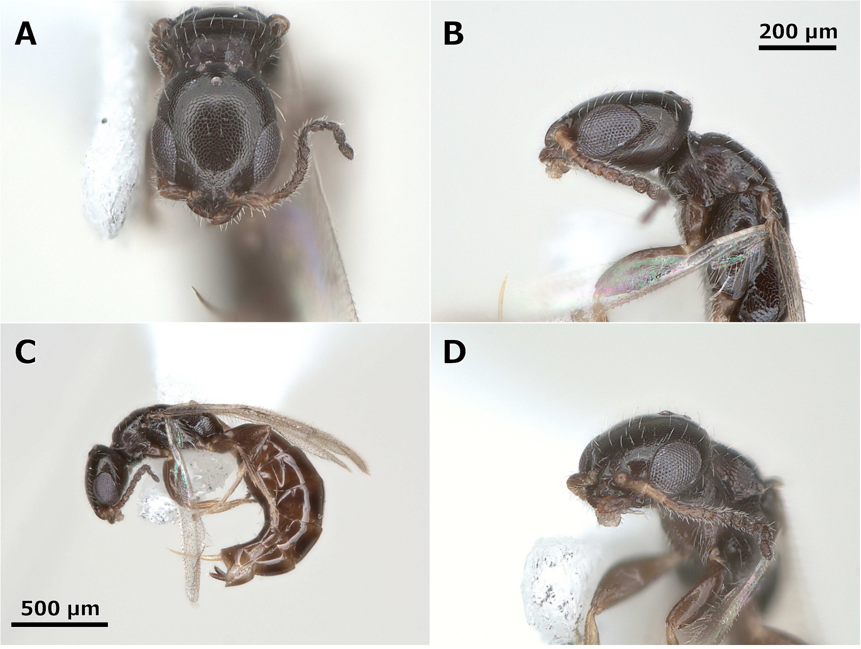


Figure 60. *Sierola maiki*. A: head, dorsal. B: head, lateral. C: lateral habitus. D: head, frontal.

Wings. Membrane hyaline. Basal cells of fore wing nearly glabrous, with only few scattered setae. Cell 1M weakly convex posteriorly, corner posteroapical.

Measurements. LFW 1.70 mm; LM 0.91 mm; WH/LH 0.86; DH/LH 0.56; EV/HE 0.70; EV/WF 0.61; WF/HE 1.15; WH/WF 1.70; OOL/WOT 1.10; DM/LM 0.44; FL/FW 2.17; HFL/HFW 2.89; A3 L/W 1.43; 2R1 L/W 2.53.

Type Material. Holotype ♀. Hawai‘i: near Humu‘ula, *Sophora*, 3 Aug 1946, E.C. Zimmerman, BPBMENT 0000018105. Paratypes: 3♀, near Humu‘ula, *Sophora*, 3 Aug 1946, E.C. Zimmerman, BPBM. 1♀, same data, *Myoporum*, BPBM.

Etymology. From the Hawaiian *māhuna*, scaly skin, referring to the distinctive frons microsculpture.

Distribution. Very rare, known only from a series of five specimens collected at Humu‘ula in 1946.

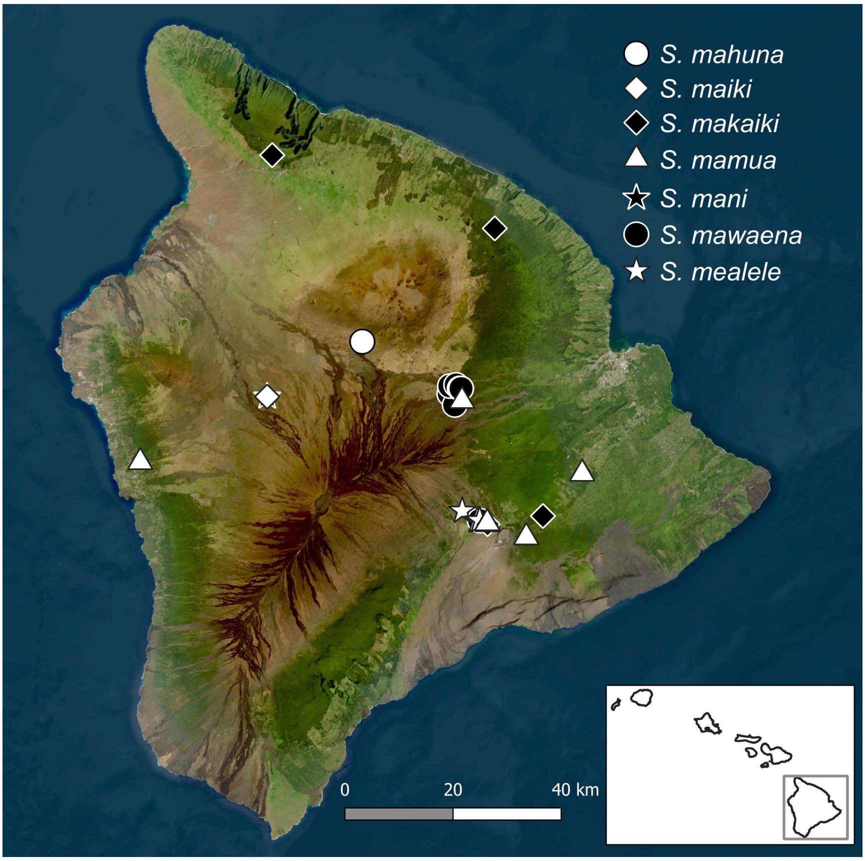
***Sierola maiki* n. sp.**

Figure 60, Map 13

Island. Hawai‘i.

Diagnosis. Separated from most other species by the small size, clypeus with a sharp carina and somewhat recurved in profile, basal wing cells nearly glabrous, and head narrow and elongate behind the eyes. Closest to *S. iki* n. sp., distinguished by having the head shorter behind the eyes and the posterior corners strongly rounded, as well as the glabrous basal wing cell. The femora are also extremely narrow, which separates it from most other species except *S. mealele* n. sp. and *S. nukupio* n. sp., both of which are very different in general appearance (compare Figs. 60, 65, and 77).

Description. **Female**. *Head*. Clypeal process semicircular to semi-elliptical, apex rounded; dorsally with a sharp carina; in profile evenly curved from base to apex, apical angle slightly acute. Mandible narrow, more or less parallel-sided except at base; apical half of mandible strongly convex outwardly, teeth arrayed on frontal and dorsal surfaces,



Map 13. Collection localities of *Sierola mahuna, S. maiki, S. makaiki, S. mamua, S. mani, S. mawaena*, and *S. mealele*.

outwardly coriaceous, somewhat dull; in ventral view evenly, moderately curved. Apex of mandible vertical, with second ventral tooth largest. Malar space very small. Dorsal setae of head distinctly longer than flagellar width. Frons with sparse, scattered punctures, mostly 3 pit widths apart or more. Vertex and gena setae similar to and only slightly longer than setae of frons. Frons microsculpture finely microreticulate, surface weakly matte. Vertex in dorsal view more or less straight, corners strongly rounded off; occipital margin broadly rounded. Lateral ocelli distinctly separate from vertex crest by less than ocellus length. Ocellar triangle front angle weakly acute. Head narrowed posterior to eyes. Dorsum of head in lateral view slightly convex, head deepest on line through posterior margin of eye. Venter of head posterior to mandible convex in lateral view, with relatively sparse setae. Head evenly convex ventrally, genal angle absent. Postgenal depression very shallow, nearly absent. Antenna extending to scutellum.

Mesosoma. Anterior margin of dorsal pronotal area in lateral view evenly rounded. Pronotal setae longer than flagellar width. Propodeal disc laterally shining, with weak microsculpture; metapleural carinae complete. Fore femur narrow, over 2.5 times as long as wide, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with faint microsculpture laterally. S2–5 each with a sparse apical row of setae and a few additional erect setae. Sixth sternum glabrous medially, with a mix of long and short setae laterally (basally with a pair of long erect setae).

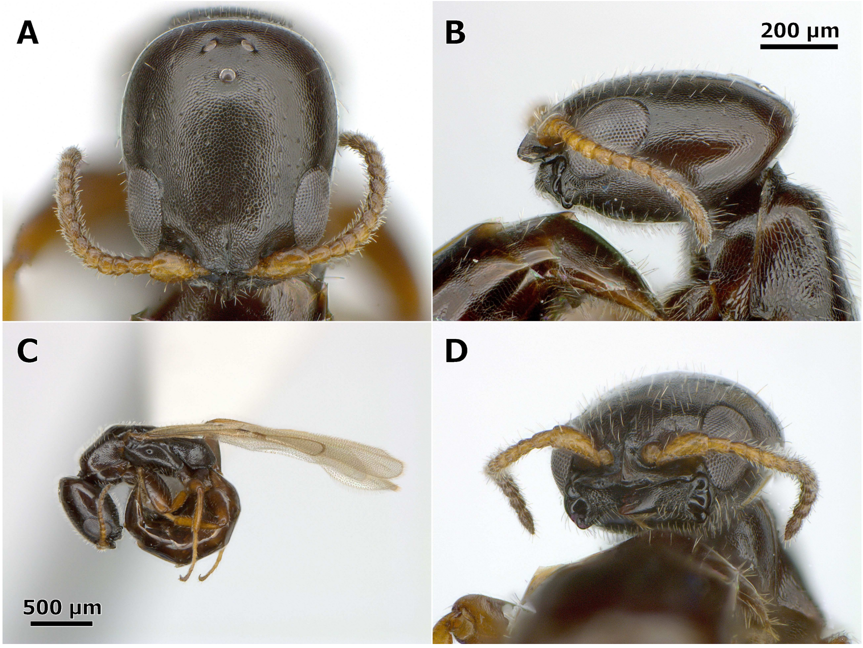


Figure 61. *Sierola makaiki*. A: head, dorsal. B: head, lateral. C: lateral habitus. D: head, frontal.

Color. Body entirely dark brown to black. Antenna entirely dark brown except ventral side of basal segments yellowish. Mandible black. Fore coxa and femur black, legs otherwise brown, paler towards tarsi.

Wings. Membrane hyaline. Basal cells of fore wing nearly glabrous, with only few scattered setae. Cell 1M weakly convex posteriorly, corner posteroapical.

Measurements. LFW 1.24 mm; LM 0.62 mm; WH/LH 0.86; DH/LH 0.55; EV/HE 0.77; EV/WF 0.73; WF/HE 1.06; WH/WF 1.76; OOL/WOT 1.38; DM/LM 0.40; FL/FW 2.58; HFL/HFW 2.78; A3 L/W 1.52; 2R1 L/W 2.94.

Type Material. Holotype ♀. Hawai‘i: Pōhakuloa Training Area, Kīpuka ‘Alalā pan trap, OUA1 CBG, 9 Feb 2001, P. Oboyski *et al.*, BPBMENT 0000018106.

Etymology. From the Hawaiian *māiki*, small, referring to the size.

Distribution. Very rare, known only from the holotype collected at Pōhakuloa.

***Sierola makaiki* n. sp.**

Figure 61, Map 13

Island. Hawai‘i.

Diagnosis. A very distinctive species, immediately recognizable by having the head broader behind the eyes and long, with the eyes correspondingly small, EV/HE ~1.55; ocellar triangle very strongly acute and lateral ocelli separated from the vertex crest by about twice their diameter; and clypeal carina sharp, almost evenly sloping in profile.

Description. **Female**. *Head*. Clypeal process short, triangular, apex pointed; dorsally with a sharp carina; in profile evenly sloping, nearly straight. Mandible moderately broad, more or less parallel-sided except at base; not twisted, at most weakly convex outwardly, outwardly coriaceous, somewhat dull; in ventral view evenly, moderately curved. Apex of mandible slightly oblique, with equally strong teeth. Malar space very small. Dorsal setae of head about as long as flagellar width or scarcely longer. Frons with shallow, uneven punctures, 1–3 pit widths apart. Vertex and gena setae similar to and only slightly longer than

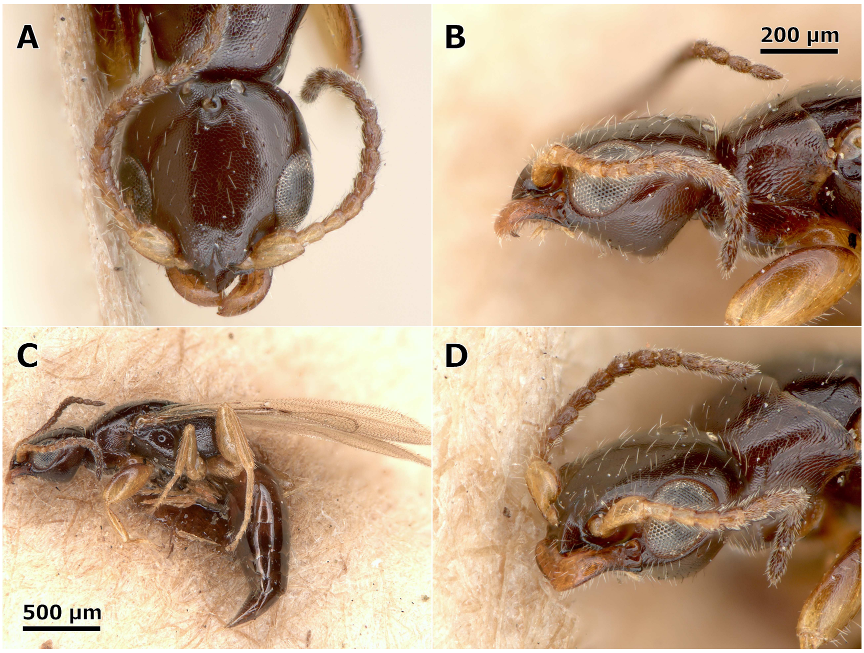


Figure 62. *Sierola mamua*. A: head, dorsal. B: head, lateral. C: lateral habitus. D: head, frontal.

setae of frons. Frons microsculpture finely microreticulate, surface weakly matte. Vertex in dorsal view more or less straight; occipital margin broadly rounded. Lateral ocelli separated from vertex crest by greater than their length. Ocellar triangle front angle very strongly acute. Head broadening posterior to eyes. Dorsum of head in lateral view slightly convex, head deepest on line well posterior of eye. Venter of head posterior to mandible convex in lateral view, with moderately dense pubescence. Head evenly convex ventrally, genal angle absent. Postgenal depression shallow, rounded. Antenna short, scarcely extending beyond head.

Mesosoma. Anterior margin of dorsal pronotal area in lateral view weakly angulate. Pronotal setae about as long as flagellar width or scarcely longer. Propodeal disc laterally shining, with weak microsculpture; metapleural carinae complete. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with smooth but distinct microreticulation over all terga. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Body entirely dark brown to black. Antenna dark brown dorsally, yellowish brown ventrally. Mandible black. Coxae and femora dark brown to black, tibiae, tarsi, and trochanters brownish orange.

Wings. Membrane tinged with yellow. Basal cells of fore wing densely and conspicuously setose.

Measurements. LFW 2.30 mm; LM 1.14 mm; WH/LH 0.78; DH/LH 0.54; EV/HE 1.55; EV/WF 1.15; WF/HE 1.35; WH/WF 1.70; OOL/WOT 2.45; DM/LM 0.34; FL/FW 2.00; HFL/HFW 2.48; A3 L/W 0.88; 2R1 L/W 3.25.

Type Material. Holotype ♀. Hawai‘i: Kohala Forest Reserve, 1,158 m, fogging *Metros. polymorpha*, 2–2, GRU 0474–005, 12 Oct 1997, D.S. Gruner & D.A. Polhemus, BPBMENT 0000018107. Paratypes: 1♀, Kīlauea, Jul 1906, R.C.L. Perkins, BPBM. 1♀, ‘Ōla‘a Forest Reserve, yellow sticky card, 6 Jan 2005, BPBM. 2♀, Laupāhoehoe, 1,170 m, 19.9302°N 155.2906°W, Malaise trap, 5 Dec 2022–9 Apr 2023, K.N. Magnacca, BPBM.

Etymology. From the Hawaiian *maka iki*, small eye, referring to the appearance in lateral view, made more exaggerated by the elongate head.

Distribution. Widely distributed in windward wet forest but rare, known only from five specimens.

***Sierola mamua* n. sp.**

Figure 62, Map 13

Island. Hawai‘i.

Diagnosis. Forming a species complex with *S. pohaku* n. sp. and *S. rocki* Fullaway, united by having the head broad and ventrally strongly convex or angulately produced, frons smooth and shining, clypeus lacking a carina and evenly curved in profile, basal wing cells glabrous to sparsely setose, and mandible yellow to reddish brown. Distinguished from the other two species by the sparsely setose basal wing cells, convex clypeus (sometimes weakly angulate), usually reddish brown mandible which is distinctly concave ventrally, ocellar triangle strongly obtuse, and head weakly convex dorsally.

Description. **Female**. *Head*. Clypeal process rounded triangular, apex weakly pointed; dorsally weakly carinate to rounded, convex, lacking a carina; in profile evenly curved from base to apex, apical angle slightly acute. Mandible moderately narrow at base, distinctly broader on apical half, ventral margin distinctly concave; not twisted, at most weakly convex outwardly, outwardly shining but with distinct, fine microsculpture; in ventral view obtusely elbowed. Apex of mandible vertical, with equally strong teeth. Malar space very small. Dorsal setae of head about as long as flagellar width or scarcely longer. Frons with distinct, uneven punctures, 1–3 pit widths apart. Vertex and gena setae similar to and only slightly longer than setae of frons. Frons microsculpture evident but smooth, shining. Vertex in dorsal view more or less straight; occipital margin broadly rounded. Lateral ocelli nearly touching vertex crest. Ocellar triangle front angle strongly obtuse. Head rounded shortly posterior to eyes. Dorsum of head in lateral view slightly convex, head deepest on line through eye. Venter of head posterior to mandible flat in lateral view, with relatively sparse setae. Head prominent ventrally, strongly convex or distinctly triangular in lateral view, apex rounded. Postgenal depression shallow, rounded. Antenna extending to mesonotum.

Mesosoma. Anterior margin of dorsal pronotal area in lateral view evenly rounded. Pronotal setae short, inconspicuous. Propodeal disc laterally coarsely striate; transverse carina faintly present, curving on each side; metapleural carinae complete. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with very faint microreticulation over posterior terga. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Body entirely dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible reddish brown to orange (rarely yellow except at the base). Legs all yellow except dorsal margins of femora tinged with brown or coxae and femora brown, tibiae, tarsi, and trochanters yellow.

Wings. Membrane tinged with yellow. Basal cells of fore wing sparsely setose, with one or two rows of setae in each cell. Cell 1M weakly convex posteriorly, corner posteroapical.

Measurements. LFW 2.17 mm; LM 1.04 mm; WH/LH 0.89 (0.89–0.92); DH/LH 0.63 (0.63–0.66); EV/HE 0.71 (0.68–0.73); EV/WF 0.53 (0.53–0.56); WF/HE 1.32 (1.25–1.33); WH/WF 1.62 (1.62–1.67); OOL/WOT 1.14 (1.14–1.21); DM/LM 0.44; FL/FW 2.00 (1.96–2.07); HFL/HFW 2.65 (2.50–2.71); A3 L/W 1.30 (1.12–1.33); 2R1 L/W 2.82. N = 6.

Type Material. Holotype ♀. Hawai‘i: Kīlauea, Aug 1896, R.C.L. Perkins, BPBMENT 0000018108. Paratypes: 1♀, ‘Ōla‘a, Jun 1895, R.C.L. Perkins, NHMUK 013380201. 1♀, Kīlauea, Jul 1895, R.C.L. Perkins, BPBM. 1♀, same data, NHMUK 013380213. 8♀, Kīlauea, Aug 1895, R.C.L. Perkins, NHMUK 013380196, 013380204, 013380206, 013380208, 013380211, 013380212, 013380216, 013380217. 41♀, Kīlauea, Aug 1896, R.C.L. Perkins, BPBM. 7♀, Kīlauea, 656, Aug 1896, R.C.L. Perkins, USNM. 1♀, same data, NHMUK 013380259. 1♀, Kīlauea, 683, Aug 1896, R.C.L. Perkins, USNM. 1♀, Kīlauea, 4,000

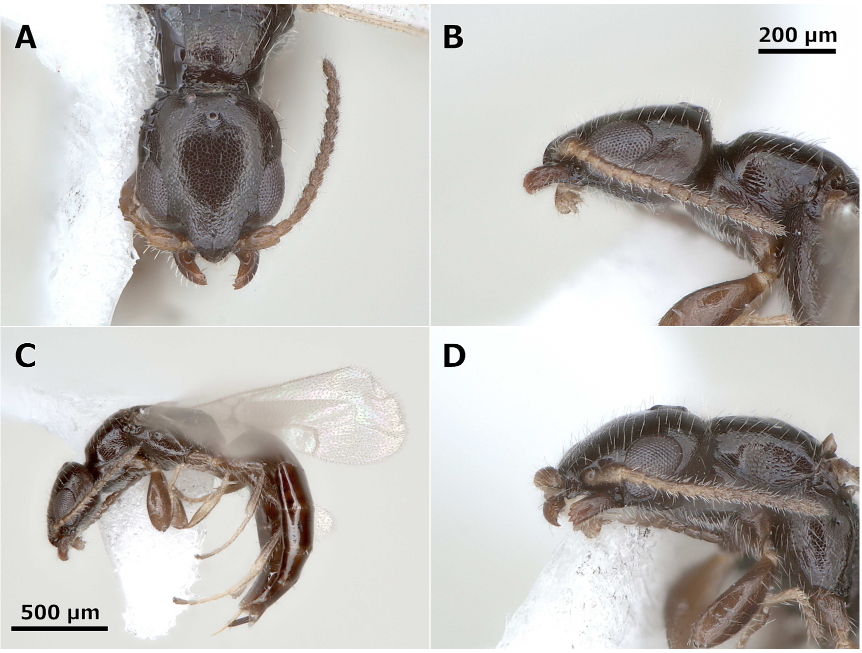


Figure 63. *Sierola mani*. A: head, dorsal. B: head, lateral. C: lateral habitus. D: head, frontal.

ft [1,220 m], Sep 1896, R.C.L. Perkins, NHMUK 013380209. 1♀, Kīlauea, 685, Sep 1896, R.C.L. Perkins, USNM. 1♀, Hawaii Volcanoes National Park, 1,200 m, fogging *Metros. polymorpha*, 9–2, GRU 1171–004, 8 Oct 1997, D.S. Gruner, BPBM.

Additional (non-type) material: 1♀, Kona, 2,000 ft [600 m], Sep 1892, R.C.L. Perkins, NHMUK 013380207 [center specimen on card]. 1♂, Upper Waiākea Forest Reserve, kīpuka 33, 19.6430°N 155.3480°W, clip *M. polymorpha*, K33-TR1–2010 HI-2123, 28 Jul 2010, D. Leopold & B. Hwang, BPBM.

Etymology. From the Hawaiian *mamua*, before or past, referring to the abundance of this species in collections by R.C.L. Perkins in the late 1800's and its near absence since then.

Distribution. Collected abundantly by Perkins at Kīlauea, but only a single specimen since 1896.

Discussion. Slight variation in the clypeus and genal angle makes this species somewhat intermediate and difficult to categorize precisely for those characters, but it is quite distinct from *S. rocki* and *S. pohaku* n. sp. by the characters listed in the diagnosis. The one specimen from Kona appears to be intermediate with *S. pohaku* n. sp.: it has the mandible concave but also glabrous wing cells and a less prominent genal angle. It is not designated as a paratype. One specimen also has the mandible yellow as in those species. One recent male appears to be this species, but the ventral margin of the mandible is not very concave and the head is more flattened. It was the most abundant in Perkins' collections, and its absence from even those of Giffard 20 years later is striking. The few recent specimens have come from canopy collections, but even there only two have been obtained among a large number of *Sierola* specimens.

***Sierola mani* n. sp.**

Figure 63, Map 13

Island. Hawai‘i.

Diagnosis. Belonging to the group of species with a sharp clypeal carina and sparsely setose basal wing cells. Separated from most others by the relatively narrow head and moderately narrow, black mandible. Closest to *S. minuta* Fullaway, separated by having the frons punctation obscure, hind femur very narrow, head less convex above and below, and OOL/WOT less than 1.30. Also similar to *S. iki* n. sp., distinguished by having the head shorter behind the eye (EV/HE ~0.76 vs. ~0.95), mandible distinctly convex outwardly, and basal wing cells clearly sparsely setose, with only one row of setae.

Description. **Female**. *Head*. Clypeal process semi-elliptical, apex weakly pointed; dorsally with a sharp carina; in profile evenly curved from base to apex, apical angle slightly acute. Mandible narrow, slightly expanded at base and apex, ventral margin weakly concave; apical half of mandible strongly convex outwardly, teeth arrayed on frontal and dorsal surfaces, outwardly coriaceous, somewhat dull; in ventral view evenly, moderately curved. Apex of mandible vertical, with teeth distinctly stronger ventrally. Malar space very small. Dorsal setae of head about as long as flagellar width or scarcely longer. Frons appearing impunctate (setae arising from shallow pits that are only visible at low angles). Vertex and gena setae distinctly longer than frons setae but only about as thick, not particularly conspicuous. Frons microsculpture evident but smooth, shining. Vertex in dorsal view more or less straight; occipital margin narrowly rounded. Lateral ocelli nearly touching vertex crest. Ocellar triangle front angle right to weakly obtuse. Head more or less parallel-sided for some distance posterior to eyes. Dorsum of head in lateral view slightly convex, head deepest on line through posterior margin of eye. Venter of head posterior to mandible flat in lateral view, with relatively sparse setae. Head evenly convex ventrally, genal angle absent. Postgenal depression shallow, rounded. Antenna extending to posterior margin of pronotum.

Mesosoma. Anterior margin of dorsal pronotal area in lateral view evenly rounded. Pronotal setae about as long as flagellar width or scarcely longer. Propodeal disc laterally coarsely rugulose; metapleural carinae complete. Fore femur only moderately expanded, more than twice as long as wide, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Highly polished, without a trace of microsculpture. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Body entirely dark brown to black. Antenna entirely dark brown except ventral side of basal segments yellowish. Mandible black to reddish brown. Coxae and femora brown, tibiae dark brown, trochanters, tarsi, and bands at bases and apices of tibiae orange.

Wings. Membrane hyaline. Basal cells of fore wing sparsely setose, cell R somewhat densely setose apically. Cell 1M weakly convex posteriorly, corner posteroapical.

Measurements. LFW 1.66 mm; LM 0.77 mm; WH/LH 0.86; DH/LH 0.57; EV/HE 0.76; EV/WF 0.66; WF/HE 1.16; WH/WF 1.68; OOL/WOT 1.16; DM/LM 0.41; FL/FW 2.31; HFL/HFW 3.15; A3 L/W 1.50; 2R1 L/W 3.46.

Type Material. Holotype ♀. Hawai‘i: Pōhakuloa Training Area, Kīpuka ‘Alalā pan trap, OUA3 CBY, 9 Feb 2001, P. Oboyski *et al.*, BPBMENT 0000018109.

Etymology. From the Hawaiian *mani*, smooth like a water-worn rock, referring to the impunctate frons.

Distribution. Very rare, known only from the holotype collected at Pōhakuloa.

***Sierola mawaena* n. sp.**

Figure 64, Map 13

Island. Hawai‘i.

Diagnosis. Part of the large group of species with the clypeus semicircular, with a sharp dorsal carina, and evenly curved or slightly recurved ventrally in profile; head moderately deep and wide (WH/LH 0.87–0.90, DH/LH 0.58–0.60); mandible black; antenna elongate, flagellar segments distinctly longer than wide; and femora narrow, FL/FW 2.20–2.40, HFL/HFW 2.45–2.70. United with *S. koolau* n. sp. by the microreticulate metasoma and unusual small, shallow emargination of the vertex crest between the ocelli; differing in having the basal wing cells with intermediate setation (clearly sparse in *S. koolau*, cell R with few setae), clypeus slightly recurved ventrally, and malar space distinct, about 1/4 as long as the basal mandible width.

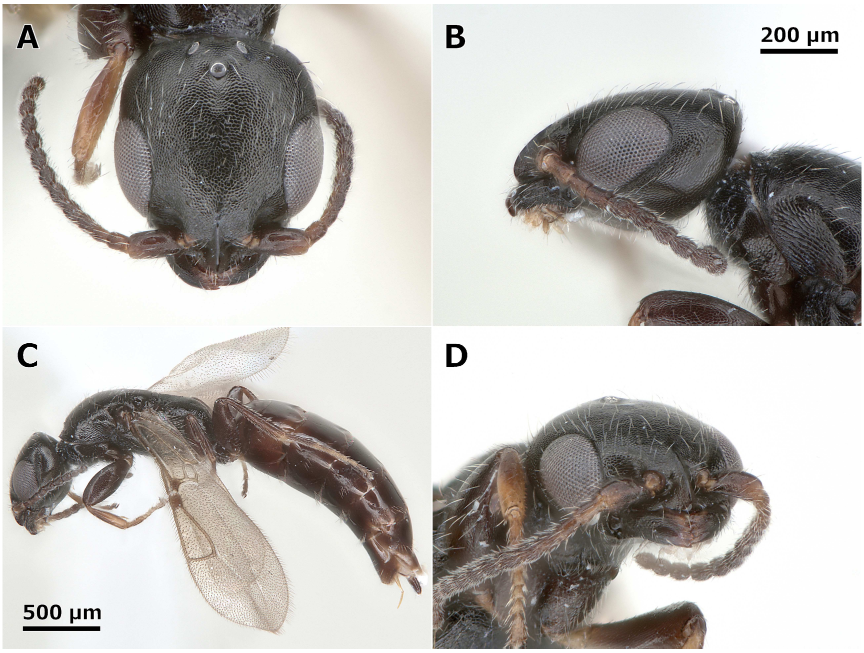


Figure 64. *Sierola mawaena*. A: head, dorsal. B: head, lateral. C: lateral habitus. D: head, frontal.

Description. **Female**. *Head*. Clypeal process semicircular, apex rounded; dorsally with a sharp carina; in profile weakly sloping dorsally but strongly rounded and recurved at apex. Mandible moderately narrow, slightly narrowed medially from base, ventral margin weakly concave; apical half of mandible strongly convex outwardly, teeth arrayed on frontal and dorsal surfaces, outwardly coriaceous, somewhat dull; in ventral view evenly, moderately curved. Apex of mandible vertical, with teeth distinctly stronger ventrally. Malar space 1/4 as long as width of base of mandible. Dorsal setae of head about as long as flagellar width or scarcely longer. Frons with shallow, uneven punctures, 1–3 pit widths apart. Vertex and gena setae similar to and only slightly longer than setae of frons. Frons microsculpture dull, granular. Vertex in dorsal view shallowly emarginate between ocelli, otherwise straight; occipital margin broadly rounded. Lateral ocelli distinctly separate from vertex crest by less than ocellus length. Ocellar triangle front angle right to weakly acute. Head more or less parallel-sided for some distance posterior to eyes. Dorsum of head in lateral view slightly convex, head deepest on line through eye. Venter of head posterior to mandible convex in lateral view, with relatively sparse setae. Head evenly convex ventrally, genal angle absent. Postgenal depression very shallow, nearly absent. Antenna extending to posterior margin of pronotum.

Mesosoma. Anterior margin of dorsal pronotal area in lateral view evenly rounded. Pronotal setae about as long as flagellar width or scarcely longer. Propodeal disc laterally finely, weakly striate; metapleural carinae nearly absent, visible only beyond propodeal declivity. Fore femur only moderately expanded, more than twice as long as wide, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with smooth but distinct microreticulation over all terga. All sterna and ventral portions of terga almost entirely microreticulate. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Body entirely dark brown to black. Antenna brown, scape yellowish on median face. Mandible black. Legs all dark brown to black.

Wings. Membrane weakly infuscate. Basal cells of fore wing with intermediate setation, each with two complete rows and a few additional setae. Cell 1M weakly convex posteriorly, corner posteroapical.

Measurements. LFW 2.21 mm; LM 1.08 mm; WH/LH 0.88 (0.87–0.90); DH/LH 0.59 (0.58–0.60); EV/HE 0.70 (0.62–0.73); EV/WF 0.58 (0.52–0.61); WF/HE 1.21 (1.15–1.21); WH/WF 1.63 (1.62–1.70); OOL/WOT 1.35 (1.29–1.39); DM/LM 0.40; FL/FW 2.30 (2.22–2.36); HFL/HFW 2.53 (2.44–2.70); A3 L/W 1.47 (1.33–1.50); 2R1 L/W 2.56. N = 7.

Type Material. Holotype ♀. Hawai‘i: Upper Waiākea FR, kīpuka 5, 1,625 m, canopy Malaise trap, collection K5-E-M, lot HI-1479, 17 Aug 2009, J. Riley & E. Parissenti, BPBMENT 0000018110. Paratypes: 1♀, Kīpuka Kī, yellow sticky card, site #16, card H, 2 May 2003, BPBM. 1♀, Upper Waiākea FR, kīpuka 30, 1,751 m, 19.6547°N 155.3703°W, canopy Malaise trap, collection K30-C-M1, lot HI-0567, 8 Apr 2009, D. Leopold, BPBM. 1♀, Upper Waiākea FR, kīpuka 38, 1,731 m, 19.6363°N 155.3609°W, canopy Malaise trap, collection K38-C-M1, lot HI-0646, 9 Apr 2009, D. Leopold, BPBM. 1♀, Upper Waiākea FR, kīpuka 29, 1,637 m, 19.6638°N 155.3496°W, canopy Malaise trap, collection K29-C-M1, lot HI-0614, 15 Apr 2009, D. Leopold, BPBM. 2♀, Upper Waiākea FR, kīpuka 9, 1,710 m, 19.6678°N 155.3693°W, canopy Malaise trap, collection K9-C-M, lot HI-1417, 20 Jul 2009, J. Riley & E. Parissenti, BPBM. 1♀, Upper Waiākea FR, kīpuka 6, 1,638 m, 19.6697°N 155.3583°W, canopy Malaise trap, collection K6-C-M, lot HI-1449, 20 Jul 2009, J. Riley & E. Parissenti, BPBM. 1♀, Upper Waiākea FR, kīpuka 29, 1,631 m, 19.6636°N 155.3497°W, canopy Malaise trap, collection K29-E-M, lot HI-1762, 17 Aug 2009, J. Riley & E. Parissenti, USNM. 1♀, Upper Waiākea FR, kīpuka 5, 1,625 m, 19.6638°N 155.3521°W, canopy Malaise trap, collection K5-E-M, lot HI-1479, 17 Aug 2009, J. Riley & E. Parissenti, USNM.

Etymology. From the Hawaiian *mawaena*, at the center, referring to the collection of nearly all known specimens of this species near the geographic center of the island.

Distribution. Known from a series of specimens collected in the Mauna Loa kīpuka mosaic, all taken in canopy Malaise traps, along with one collected near Kīlauea.

Discussion. This species is probably more widespread than its collection records indicate, and has not been collected due to its canopy-dwelling habits. Notably, it was collected only in Malaise traps while *S. mahana* n. sp. was collected in similar kīpuka (one of them overlapping with *S. mawaena*) only by branch clippings, suggesting differences in behavior that affect how they are collected. It appears to be related to the *S. puuwaawaa* complex of species, but the moderately dense setae of the basal wing cells may cause it to run closer to *S. compacta* and related species.

Sierola mealele n. sp.

Figure 65, Map 13

Island. Hawai‘i.

Diagnosis. Belonging to the group of species with the head and mesosoma compressed and more or less flattened, sharp clypeal carina, and basal wing cells sparsely setose. Close to *S. hooneo* n. sp. and *S. holomelaena* Fullaway in having the clypeus rounded and recurved ventrally. Separated from the former by the strongly acute ocellar triangle and much greater OOL/WOT, and from the latter by the narrow head and fore femur. Also similar to *S. molina* n. sp., but that species has the clypeus short and steeply curved in profile, not recurved.

Description. **Female**. *Head*. Clypeal process semicircular, apex rounded; dorsally with a sharp carina; in profile weakly sloping dorsally but strongly rounded and recurved at apex. Mandible moderately broad, slightly narrowed medially and expanded at apex, ventral margin weakly concave; not twisted, at most weakly convex outwardly, outwardly shining but with distinct, fine microsculpture; in ventral view evenly, moderately curved. Apex of mandible vertical, with teeth distinctly stronger ventrally. Malar space almost absent. Dorsal setae of head about as long as flagellar width or scarcely longer. Frons with distinct, uneven punctures, 1–3 pit widths apart. Vertex and gena setae similar to and only slightly longer than setae of frons. Frons microsculpture finely microreticulate, surface weakly matte. Vertex in dorsal view more or less straight; occipital margin broadly rounded. Lateral ocelli distinctly separate from vertex

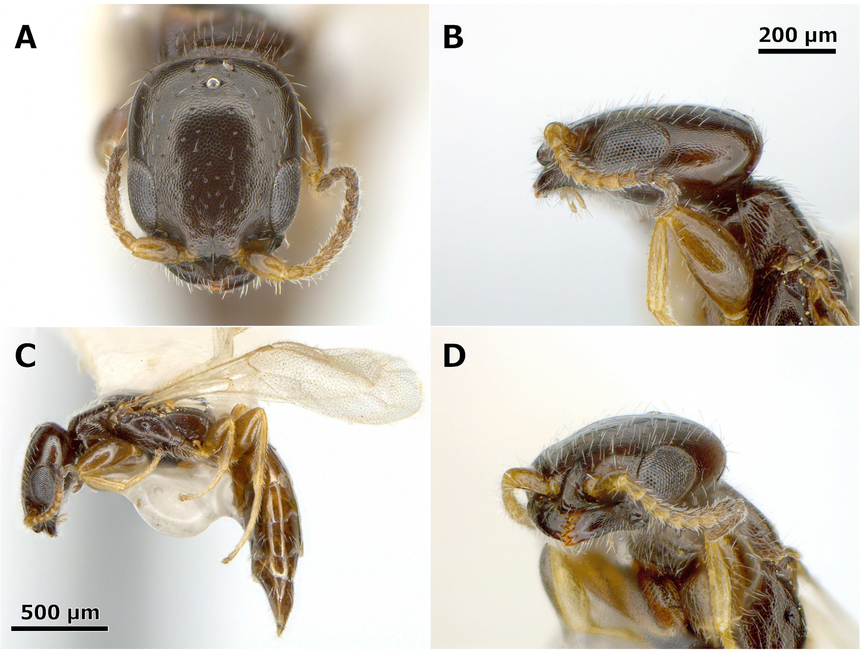


Figure 65. *Sierola mealele*. A: head, dorsal. B: head, lateral. C: lateral habitus. D: head, frontal.

crest by less than ocellus length. Ocellar triangle front angle strongly acute. Head more or less parallel-sided for some distance posterior to eyes. Dorsum of head in lateral view slightly convex, head deepest on line through posterior margin of eye. Venter of head posterior to mandible convex in lateral view, with relatively sparse setae. Head weakly convex ventrally, genal angle absent. Postgenal depression absent. Antenna extending to anterior margin of pronotum.

Mesosoma. Strongly dorsoventrally compressed. Anterior margin of dorsal pronotal area in lateral view evenly rounded. Pronotal setae longer than flagellar width. Propodeal disc laterally finely, weakly striate; metapleural carinae present posteriorly, fading anteriorly. Fore femur only moderately expanded, more than twice as long as wide, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with faint microsculpture laterally. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Body entirely dark brown to black. Antenna dark brown dorsally, yellowish brown ventrally. Mandible black. Coxae and femora dark brown to black, tibiae dark brown, trochanters, tarsi, and bands at bases and apices of tibiae orange.

Wings. Membrane hyaline. Basal cells of fore wing sparsely setose, with one or two rows of setae in each cell. Cell 1M weakly convex posteriorly, corner posteroapical.

Measurements. LFW 1.79 mm; LM 0.83 mm; WH/LH 0.78; DH/LH 0.47; EV/HE 1.19; EV/WF 0.85; WF/HE 1.40; WH/WF 1.58; OOL/WOT 2.40; DM/LM 0.33; FL/FW 2.40; HFL/HFW 2.18; A3 L/W 1.25; 2R1 L/W 3.12.

Type Material. Holotype ♀. Hawai‘i: Mauna Loa Strip, 5,000 ft [1,520 m], ex *Acacia koa*, 23 Sep 1974, J. Leeper, BPBMENT 0000018111. Paratypes: 1♀, Mauna Loa Strip Road, 4,300 ft [1,300 m], *Acacia koa*, 30 Sep 1972, J.W. Beardsley, BPBM. 1♀, Kīpuka Kī, yellow sticky card, site #21, card A, 15 Jul 2003, BPBM. 1♀, Kīpuka Kī, yellow sticky card, site #22, card B, 29 May 2004, BPBM.

Etymology. From the Hawaiian *mea lele*, one that jumps, referring to the collector of the holotype, J. Leeper.

Distribution. Known from only four specimens, collected close together at Hawaii Volcanoes.

Discussion. See comments under *S. holomelaena*.

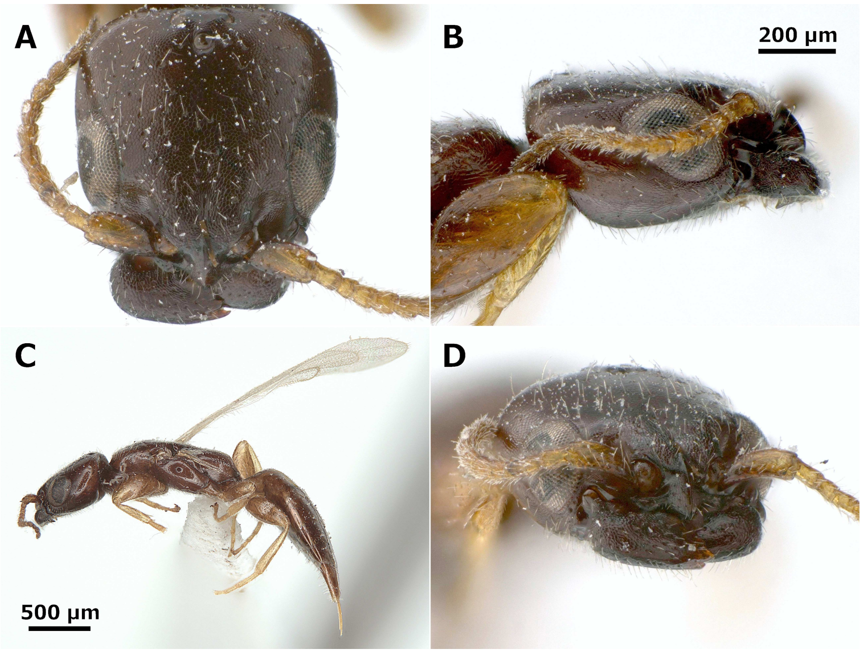


Figure 66. *Sierola megalognatha*. A: head, dorsal. B: head, lateral. C: lateral habitus. D: head, frontal.

***Sierola megalognatha* Fullaway, 1920**

Figure 66, Map 14

Sierola megalognatha Fullaway, 1920: 89.

Island. Hawaiʻi.

Diagnosis. Immediately recognizable by the massive mandible, elbowed at nearly 90° and protruding laterally to a level with the median eye margin in dorsal view even when fully closed. The frons is very broad and relatively long behind the eyes, clypeus triangular and pointed apically, and basal wing cells nearly glabrous. Probably related to *S. koa* Fullaway of Oʻahu, but readily distinguished from that species by the wider head and larger mandible which is broad through its entire length, not constricted near the base, and twisted rather than evenly convex outwardly.

Description. **Female**. *Head*. Clypeal process triangular, apex pointed; dorsally weakly carinate; in profile evenly curved from base to apex, apical angle slightly acute. Mandible broad, not narrowed from base, ventral margin nearly straight; strongly twisted, outwardly shining but with distinct, fine microsculpture; in ventral view strongly elbowed. Apex of mandible vertical, with equally strong teeth. Malar space very small. Dorsal setae of head about as long as flagellar width or scarcely longer. Frons with shallow, uneven punctures, 1–3 pit widths apart. Vertex and gena setae similar to and only slightly longer than setae of frons. Frons microsculpture finely microreticulate, surface weakly matte. Vertex in dorsal view more or less straight; occipital margin broadly rounded. Lateral ocelli nearly touching vertex crest. Ocellar triangle front angle right. Head broadening posterior to eyes. Dorsum of head in lateral view nearly flat, head deepest on line well posterior of eye. Venter of head posterior to mandible convex in lateral view, with relatively sparse setae. Genal angle broadly rounded. Postgenal depression shallow, rounded. Antenna extending to pronotum.

Mesosoma. Anterior margin of dorsal pronotal area in lateral view weakly angulate. Pronotal setae about as long as flagellar width or scarcely longer. Propodeal disc laterally shining,

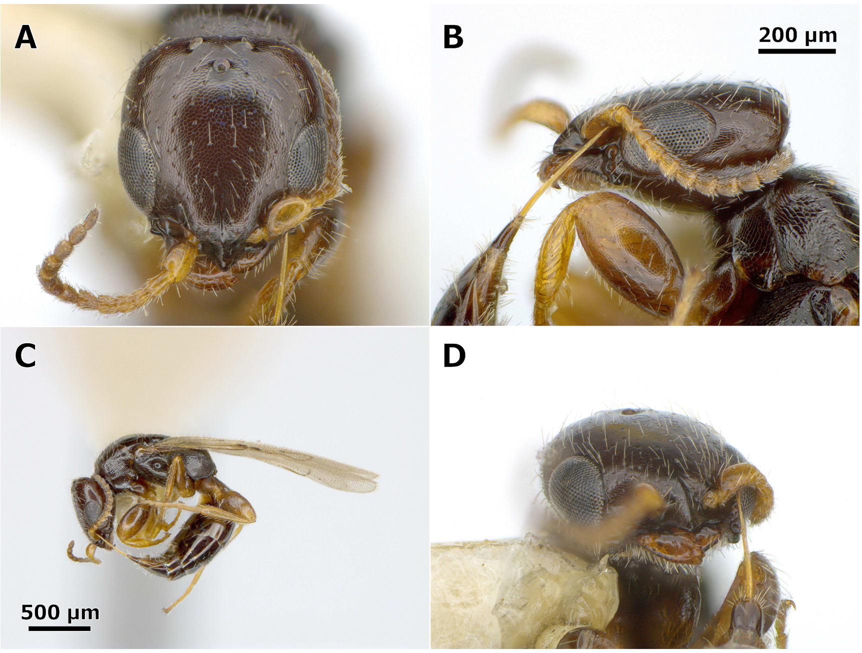


Figure 67. *Sierola milo*. A: head, dorsal. B: head, lateral. C: lateral habitus. D: head, frontal.

with weak microsculpture; median carina absent; metapleural carinae present posteriorly, fading anteriorly. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Highly polished, without a trace of microsculpture. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Body entirely dark brown to black. Antenna dark brown dorsally, yellowish brown ventrally. Mandible black. Coxae and femora brown, tibiae, tarsi, and trochanters brownish orange.

Wings. Membrane hyaline. Basal cells of fore wing mostly glabrous, cell R densely setose apically.

Measurements. LFW 2.28 mm; LM 1.14 mm; WH/LH 0.93; DH/LH 0.55; EV/HE 0.91; EV/WF 0.59; WF/HE 1.55; WH/WF 1.59; OOL/WOT 1.85; DM/LM 0.33; FL/FW 2.11; HFL/HFW 2.25; A3 L/W 1.00.

Type Material. Holotype ♀ and allotype ♂. Hawai‘i: Pu‘u Wa‘awa‘a, 3,700 ft [1,130 m], Aug 1917, W.M. Giffard, BPBMENT 0000000035.

Material examined: 1♀, Kīlauea, Aug 1896, R.C.L. Perkins, BPBM. 1♀, Pu‘u Wa‘awa‘a, 3,700 ft [1,130 m], Aug 1917, W.M. Giffard, BPBM (paratype).

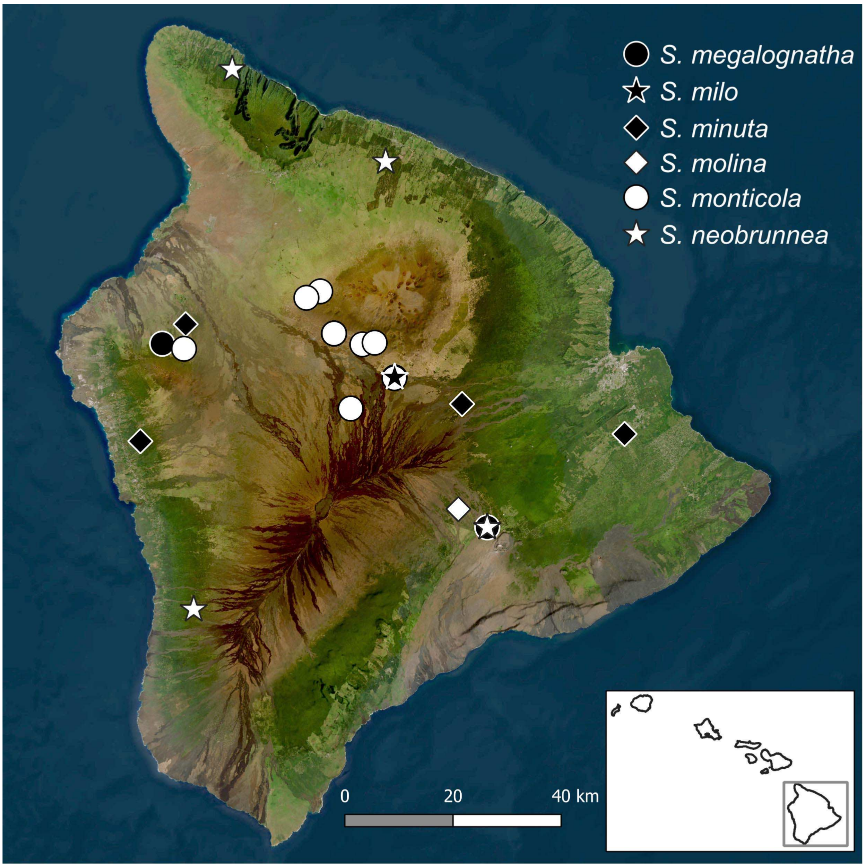
Distribution. Very rare, known only from the type series taken at Pu‘u Wa‘awa‘a and one earlier at Kīlauea. Last seen in 1917.

***Sierola milo* n. sp.**

Figure 67, Map 14

Island. Hawai‘i.

Diagnosis. Recognized by having the clypeus rounded triangular, dorsally angulate but lacking a sharply raised carina and evenly sloping in profile; mandible reddish brown and strongly convex outwardly, moderately narrow and distinctly concave ventrally; and



Map 14. Collection localities of *Sierola megalognatha, S. milo, S. minuta, S. molina, S. monticola*, and *S. neobrunnea*.

basal wing cells sparsely setose. Closest to *S. kumole* n. sp., separated by the darker mandible, more compressed head (DH/LH 0.56 vs. 0.64) and distinctly broad fore and hind femora.

Description. **Female**. *Head*. Clypeal process rounded triangular, apex weakly pointed; dorsally weakly carinate; in profile evenly curved from base to apex, apical angle slightly acute (rounded at apex). Mandible moderately narrow at base, distinctly broader on apical half, ventral margin distinctly concave; apical half of mandible strongly convex outwardly, teeth arrayed on frontal and dorsal surfaces, outwardly polished, smooth, shining; in ventral view strongly elbowed. Apex of mandible vertical, with teeth distinctly stronger ventrally. Malar space almost absent. Dorsal setae of head distinctly longer than flagellar width. Frons moderately punctate, about 2–3 pit widths apart. Vertex and gena setae similar to and only slightly longer than setae of frons. Frons microsculpture evident but smooth, shining. Vertex in dorsal view more or less straight; occipital margin broadly rounded. Lateral ocelli nearly touching vertex crest. Ocellar triangle front angle right. Head more or less parallel-sided for some distance posterior to eyes. Dorsum of head in lateral view slightly convex, head deepest on line through posterior margin of eye. Venter of head posterior to mandible convex in lateral view, with relatively sparse setae. Genal angle present posteriorly, not prominent, head relatively flat. Postgenal depression absent. Antenna extending to posterior margin of pronotum.

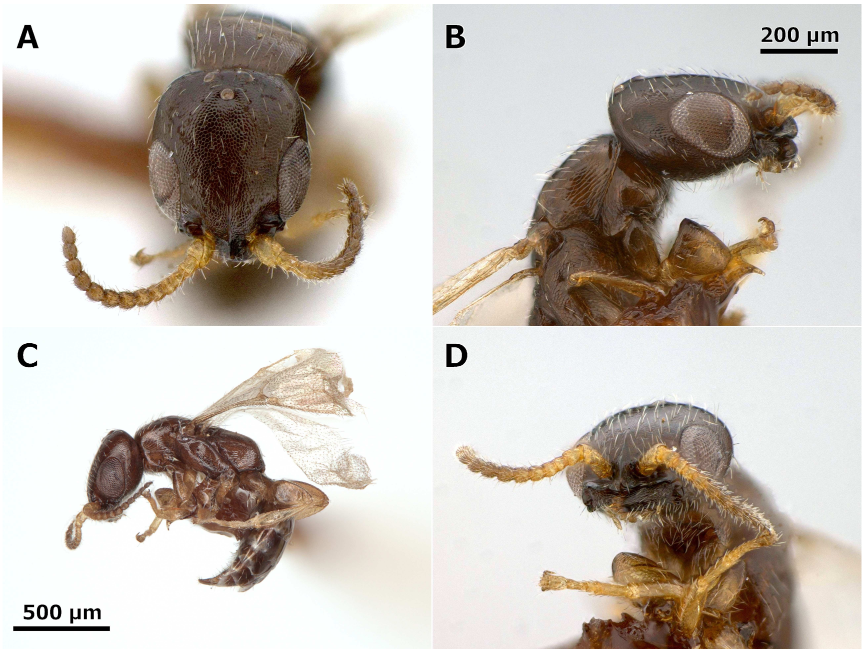


Figure 68. *Sierola minuta*. A: head, dorsal. B: head, lateral. C: lateral habitus. D: head, frontal.

Mesosoma. Anterior margin of dorsal pronotal area in lateral view evenly rounded. Pronotal setae longer than flagellar width. Propodeal disc laterally coarsely striate; metapleural carinae complete. Fore femur strongly expanded, less than twice as long as wide, with both anterior and posterior surfaces convex, not strongly compressed, more or less straight in dorsal view.

Metasoma. Shining, with smooth but distinct microreticulation over all terga. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Body entirely dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible reddish brown. Coxae and femora dark brown to black, fore tibia and tarsus and all trochanters yellow, mid and hind tibiae and tarsi brownish.

Wings. Membrane tinged with yellow. Basal cells of fore wing sparsely setose, with one or two rows of setae in each cell. Cell 1M weakly convex posteriorly, corner posteroapical.

Measurements. LFW 2.00 mm; LM 1.02 mm; WH/LH 0.88; DH/LH 0.56; EV/HE 0.80; EV/WF 0.62; WF/HE 1.30; WH/WF 1.65; OOL/WOT 1.34; DM/LM 0.41; FL/FW 1.83; HFL/HFW 2.16; A3 L/W 1.17; 2R1 L/W 2.8.

Type Material. Holotype ♀. Hawai‘i: Humu‘ula, 7 Aug 1946, E.C. Zimmerman, BPBMENT 0000018112.

Etymology. From the Hawaiian *milo*, curl or twist, referring to the condition of the type specimen.

Distribution. Known only from the holotype, collected at Humu‘ula in 1946.

Sierola minuta Fullaway, 1920

Figure 68, Map 14

Sierola minuta Fullaway, 1920: 106.

Island. Hawai‘i.

Diagnosis. Belonging to the group of species with a sharp clypeal carina and sparse setation of the basal wing cells. Separated from most others by the relatively narrow head and moderately narrow, black mandible. Closest to *S. mani* n. sp., separated by having the frons distinctly punctate, hind femur much broader, head more convex above and below, and OOL/WOT 1.36–1.45. Also similar to *S. iki* n. sp., distinguished by having the head shorter behind the eye (EV/HE 0.70–0.80 vs. ~0.95), mandible distinctly convex outwardly, and basal wing cells clearly sparsely setose, with only one row of setae.

Description. **Female**. *Head*. Clypeal process semi-elliptical, apex broadly rounded; dorsally with a sharp carina; in profile evenly curved from base to apex, apical angle slightly acute. Mandible moderately narrow, more or less parallel-sided except at base; apical half of mandible strongly convex outwardly, teeth arrayed on frontal and dorsal surfaces, outwardly coriaceous, somewhat dull; in ventral view evenly, moderately curved. Apex of mandible vertical, with equally strong teeth. Malar space very small. Dorsal setae of head about as long as flagellar width or scarcely longer. Frons with shallow, uneven punctures, 1–3 pit widths apart. Vertex and gena setae similar to and only slightly longer than setae of frons. Frons microsculpture finely microreticulate, surface weakly matte. Vertex in dorsal view more or less straight; occipital margin broadly rounded. Lateral ocelli nearly touching vertex crest. Ocellar triangle front angle weakly acute. Head more or less parallel-sided for some distance posterior to eyes. Dorsum of head in lateral view slightly convex, head deepest on line through posterior margin of eye. Venter of head posterior to mandible convex in lateral view, with relatively sparse setae. Head evenly convex ventrally, genal angle absent. Postgenal depression very shallow, nearly absent. Antenna extending to pronotum.

Mesosoma. Anterior margin of dorsal pronotal area in lateral view evenly rounded. Pronotal setae longer than flagellar width. Propodeal disc laterally shining, with weak microsculpture; metapleural carinae present posteriorly, fading anteriorly. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Highly polished, without a trace of microsculpture. Sixth sternum narrowly glabrous medially, laterally with dense pilose setae.

Color. Body entirely dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible black. Coxae and femora dark brown to black, tibiae, tarsi, and trochanters yellow.

Wings. Membrane tinged with yellow. Basal cells of fore wing sparsely setose, with one or two rows of setae in each cell.

Measurements. LFW 1.49 mm; LM 0.73 mm; WH/LH 0.84 (0.84–0.86); DH/LH 0.55 (0.54–0.56); EV/HE 0.71 (0.71–0.78); EV/WF 0.64 (0.60–0.68); WF/HE 1.11 (1.11–1.18); WH/WF 1.69 (1.68–1.70); OOL/WOT 1.45 (1.36–1.45); DM/LM 0.36; FL/FW 1.92–2.08; HFL/HFW 2.22 (2.14–2.22); A3 L/W 1.00 (1.00–1.11). N = 3.

Type Material. Holotype ♀. Hawai‘i: Middle Puna, 750 ft [230 m], 6 Aug 1918, W.M. Giffard, BPBMENT 0000000068.

Material examined: 1♀, S. Kona, 11 Aug 1919, O.H. Swezey, BPBM. 1♀, Mt Hualālai, 2,500 ft [760 m], 28 Jun 1966, J.W. Beardsley, BPBM. 1♀, Pu‘u Wa‘awa‘a cone, 3,600 ft [1,100 m], 19.7750°N 155.8330°W, on *Sapindus saponaria* fruit, 13 Aug 2012, K.N. Magnacca, KNMC. 1♀, Upper Waiākea FR, kīpuka 33, 1,664 m, 19.6432°N 155.3478°W, ‘ōhi‘a canopy branch clipping, collection 521, lot H.R.0112, 8 May 2013, P. LoCicero & C. Morrison, USNM.

Distribution. Rare, known from only five specimens, but widely distributed.

Discussion. The wings and front femur of the holotype are distorted and could not be measured; LFW is estimated based on the ratio of the intact basal portion observed in the other specimens.

***Sierola molina* n. sp.**

Figure 69, Map 14

Island. Hawai‘i.

Diagnosis. Belonging to the group of species with the head and mesosoma compressed and more or less flattened, sharp clypeal carina, and basal wing cells sparsely setose. Closest to *S. mealele* n. sp. in having the head and fore femur narrow, but differing in having the clypeus not recurved ventrally, frons much narrower (WF/HE ~1.0 vs. 1.4), and OOL/WOT ~2.05 rather than 2.18–2.47.

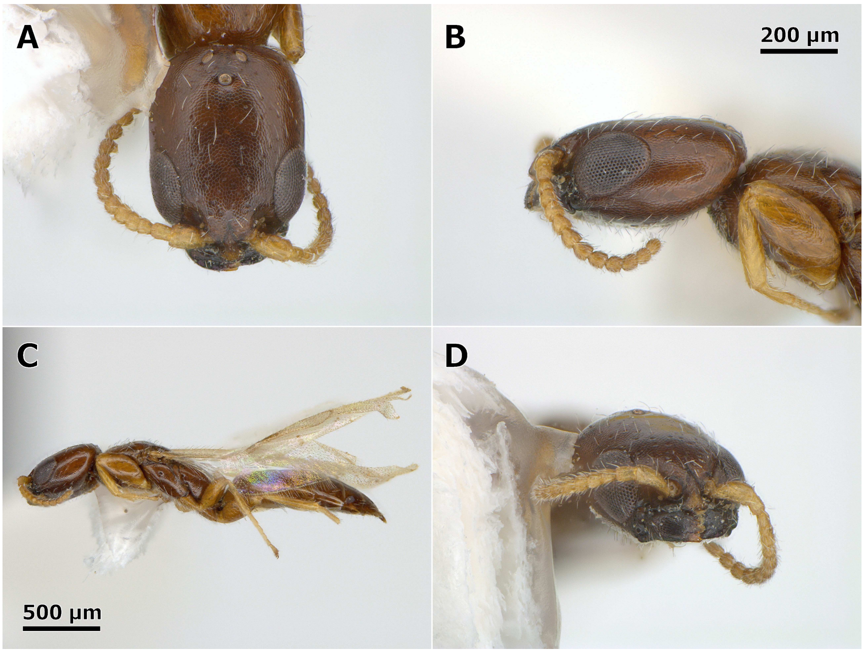


Figure 69. *Sierola molina*. A: head, dorsal. B: head, lateral. C: lateral habitus. D: head, frontal.

Description. **Female**. *Head*. Clypeal process semi-elliptical, apex broadly rounded; dorsally with a sharp carina; in profile evenly sloping, nearly straight. Mandible broad to moderately broad, more or less parallel-sided; not twisted, at most weakly convex outwardly, outwardly coriaceous, somewhat dull; in ventral view obtusely elbowed. Apex of mandible vertical, with teeth distinctly stronger ventrally. Malar space almost absent. Dorsal setae of head distinctly longer than flagellar width. Frons with moderately close punctures between antennae and midpoint of eyes, 1–3 pit widths apart, sparse posteriorly. Vertex and gena setae similar to and only slightly longer than setae of frons. Frons microsculpture finely microreticulate, surface weakly matte. Vertex in dorsal view more or less straight; occipital margin broadly rounded. Lateral ocelli separated from vertex crest by about their own length. Ocellar triangle front angle strongly acute. Head more or less parallel-sided for some distance posterior to eyes. Dorsum of head in lateral view nearly flat, head deepest on line through posterior margin of eye. Venter of head posterior to mandible convex in lateral view, with relatively sparse setae. Head nearly flat ventrally, genal angle absent. Postgenal depression absent. Antenna extending to pronotum.

Mesosoma. Strongly dorsoventrally compressed. Anterior margin of dorsal pronotal area in lateral view evenly rounded. Pronotal setae longer than flagellar width. Propodeal disc laterally shining, with weak microsculpture; metapleural carinae nearly absent, visible only beyond propodeal declivity. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with faint microsculpture laterally. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Body entirely dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible black. Coxae and femora dark brown to black, tibiae dark brown, trochanters, tarsi, and bands at bases and apices of tibiae orange.

Wings. Membrane hyaline. Basal cells of fore wing sparsely setose, with one or two rows of setae in each cell. Cell 1M weakly convex posteriorly, corner posteroapical.

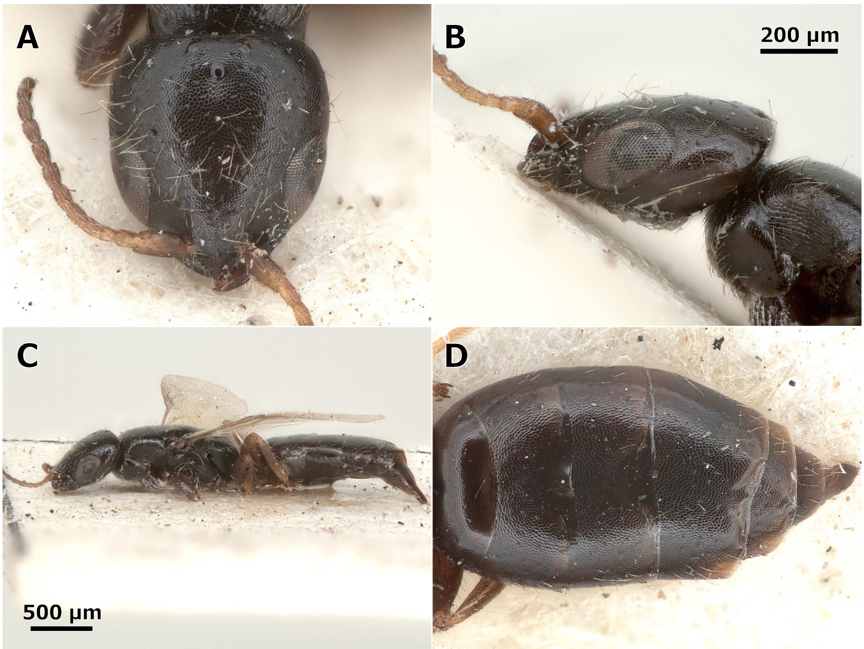


Figure 70. *Sierola monticola*. A: head, dorsal. B: head, lateral. C: lateral habitus. D: metasoma, dorsal.

Measurements. LFW 1.80 mm; LM 0.83 mm; WH/LH 0.72; DH/LH 0.49; EV/HE 1.16; EV/WF 1.03; WF/HE 1.12; WH/WF 1.72; OOL/WOT 2.04; DM/LM 0.30; FL/FW 2.14; HFL/HFW 2.28; A3 L/W 1.09; 2R1 L/W 3.44.

Type Material. Holotype ♀. Hawai‘i: Mauna Loa Strip Road, 5,300 ft [1,620 m], *Acacia koa*, 2 Jul 1972, J.W. Beardsley, BPBMENT 0000018113.

Etymology. From the Hawaiian *mōlina*, a strip (as of cloth or wood), referring to the type locality and the narrow head.

Distribution. Known from only from the holotype, collected north of Kīlauea at Hawaii Volcanoes.

Discussion. The holotype is slightly bleached and the leg coloration is somewhat uncertain, particularly on the tibiae. See comments under *S. holomelaena*.

Sierola monticola Blackburn & Cameron, 1886

Figure 70, Map 14

Sierola monticola Blackburn & Cameron, 1886: 176.

Island. Hawai‘i.

Diagnosis. Part of the large group of species with a sharp, evenly curved clypeal carina and densely setose basal wing cells. A very distinctive species, easily recognized by the strongly sculpted and punctate metasoma. Very similar to *S. nigrans* Fullaway, separated by having the head elongate and compressed (DH/LH 0.49–0.52, EV/HE 0.85–0.96), and weakly convex ventrally. Among others only *S. opakapaka* n. sp. has the metasoma distinctly coriaceous; in that species the head is much deeper, DH/LH ≥0.60.

Description. **Female**. *Head*. Clypeal process rounded triangular, apex pointed; dorsally with a sharp carina; in profile evenly curved from base to apex, apical angle slightly acute. Mandible narrow, slightly expanded at base and apex, ventral margin weakly concave; apical half of mandible strongly convex outwardly, teeth arrayed on frontal and dorsal surfaces, outwardly coriaceous, somewhat dull; in ventral view weakly curved. Apex of mandible vertical, with equally strong teeth. Malar space 1/4 as long as width of base of mandible. Dorsal setae of head about twice as long as flagellar width or more. Frons with shallow punctures, dense near antennae, 2–3 pit widths apart posterior of midpoint of eyes. Vertex and gena setae conspicuous, nearly twice as long as setae of frons and stronger, erect and directed anterior. Frons microsculpture coriaceous, matte but without strong surface texture. Vertex in dorsal view very slightly concave; occipital margin not carinate but forming a pronounced ridge. Lateral ocelli distinctly separate from vertex crest by less than ocellus length. Ocellar triangle front angle weakly acute. Head more or less parallel-sided for some distance posterior to eyes. Dorsum of head in lateral view slightly convex, head deepest on line through posterior margin of eye. Venter of head posterior to mandible flat in lateral view, with moderately dense pubescence. Head weakly convex ventrally, genal angle absent. Gena ventral to eye flat. Postgenal depression absent. Antenna extending to mesonotum.

Mesosoma. Anterior margin of dorsal pronotal area in lateral view almost evenly sloping, weakly curved. Pronotal setae elongate, twice as long as flagellar width or more. Propodeal disc laterally finely, weakly striate; metapleural carinae complete. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Punctate and coriaceous, with distinct microreticulation. Sixth sternum evenly covered with short, anteriorly-directed setae.

Color. Body entirely dark brown to black. Antenna with scape dark brown basally, yellow to orange apically, flagellum brown dorsally and yellow ventrally. Mandible black, reddish at apex before teeth. Coxae and femora dark brown to black, trochanters and tibiae tinged with brown, tarsi yellow.

Wings. Membrane hyaline. Basal cells of fore wing very densely setose, with five or more rows of setae in cell R. Cell 1M weakly convex posteriorly, corner posteroapical.

Measurements. LFW 2.03 mm; LM 1.00 mm; WH/LH 0.88 (0.87–91); DH/LH 0.51 (0.49–0.52); EV/HE 0.92 (0.85–0.96); EV/WF 0.72 (0.66–0.76); WF/HE 1.28 (1.24–1.31); WH/WF 1.70 (1.66–1.78); OOL/WOT 1.62 (1.53–1.69); DM/LM 0.43; FL/FW 2.00 (1.89–2.18); HFL/HFW 2.14 (2.14–2.40); A3 L/W 1.32 (1.22–1.38); 2R1 L/W 2.85. N =10.

Type Material. Holotype ♀. Hawai‘i: 134, T. Blackburn, BPBM.

Material examined: 5♀, Humu‘ula, *Myoporum*, 31 Jul 1935, R.L. Usinger, BPBM. 1♀, near Humu‘ula, *Myoporum*, 3 Aug 1946, E.C. Zimmerman, BPBM. 1♀, Pōhakuloa, 6,000 ft [1,830 m], 18 Jun 1966, J.W. Beardsley, BPBM. 5♀ 3♂, Pōhakuloa, 1,800 m, 21 Jun 1966, J.W. Beardsley, BPBM. 4♀ 2♂, Pōhakuloa, 6,000 ft [1,830 m], 21 Jun 1966, J.W. Beardsley, BPBM. 1♀, Pōhakuloa, 21 Jun 1966, J.W. Beardsley, BPBM. 1♀, Pōhakuloa, 1,800 m, 21 Jun 1966, J.W. Beardsley, BPBM. 29♀ 8♂, Pōhakuloa, 1,800 m, 25 Jun 1966, J.W. Beardsley, BPBM. 1♀, Pōhakuloa, 3,800 ft [1,160 m], 29 Jun 1966, J.W. Beardsley, BPBM. 1♀, between Pu‘u La‘au & Ahumoa, 7,400 ft [2,260 m], sweeping *Sophora*, 9 Jan 1990, W.D. Perreira, BPBM. 3♀, Pōhakuloa Training Area: 0.8 mi. NE of Saddle Rd, ex *Coprosma* & Mamane, Saddle Rd realignment project, PTA-3, 11+260, 21 Aug 1996, G.M. Nishida, BPBM. 1♀, Ka‘ohe Game Mgmt. Area, ~1 mi N. Ahumoa, 6,000 ft [1,830 m], 25 Oct 1996, M.J. & C.A. Tauber, BPBM. 1♀, Pu‘u Wa‘awa‘a, West Kīleo, 4,300 ft [1,300 m], 19.7345°N 155.8359°W, beating *Metrosideros*, 27 Jan 2012, K.N. Magnacca, KNMC. 2♂, Pu‘u Kolī, 7,100 ft [2,160 m], 19.6357°N 155.5433°W, on *Sophora*, 23 Oct 2012, K.N. Magnacca, KNMC. 1♀ 1♂, Pu‘u Kolī, 7,100 ft [2,160 m], 19.6357°N 155.5433°W, on *Myoporum*, 28 Nov 2012, K.N. Magnacca, KNMC. 6♀ 1♂, Pu‘u Huluhulu, 6,700 ft [2,040 m], 19.6859°N 155.4667°W, beating *Acacia koa*, 9 Jan 2013, K.N. Magnacca, KNMC.

Distribution. Restricted to dry to dry-mesic forest from Pu‘u Wa‘awa‘a to the Pōhakuloa–Humu‘ula saddle region, where it is moderately common.

Discussion. The microsculpture of the head and thorax (but not propodeum) is very regular and areolate, much more conspicuous than most species. The prominent sculpturing of the abdomen is almost unique in the Hawaiian taxa and will immediately serve to distinguish it together with the sister species *S. nigrans*, which is found at wetter and lower sites. There is some confusion about the identity of the type. The description says “mountains of Hawaii (no. 134),” with no indication if more than one specimen was available. A specimen at NHMUK (referenced in Magnacca 2019) had been presumed to be the unique holotype.

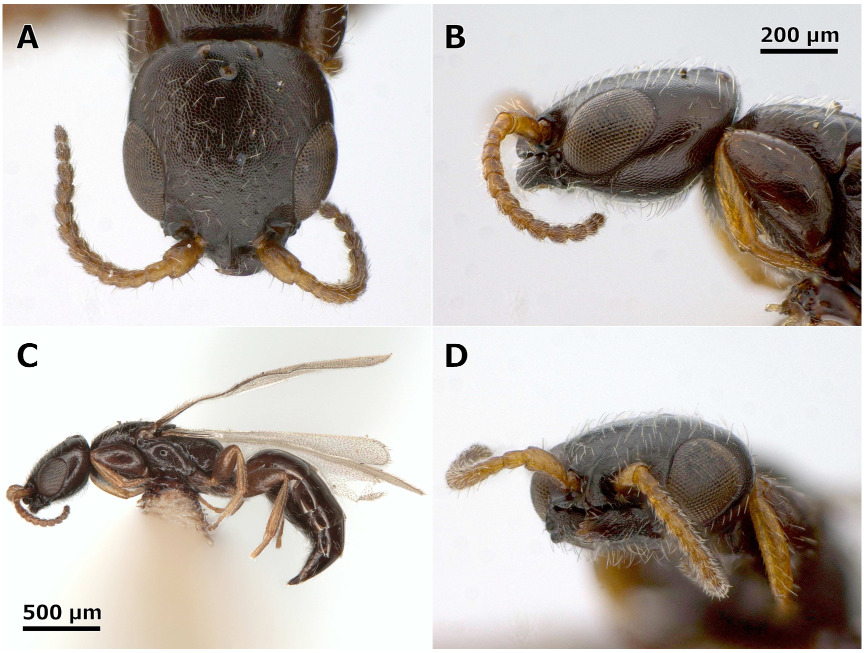


Figure 71. *Sierola nemorensis*. A: head, dorsal. B: head, lateral. C: lateral habitus. D: head, frontal.

The NHMUK specimen has no markings or labels other than "Sierola monticola Cam Hawaii" written on the underside of the card with the specimen. In contrast, a specimen at the Bishop Museum is mounted on a card with Blackburn's symbol for the island of Hawai‘i and "134" written on it (analogous to the "94" found on the label of the type of *S. testaceipes* Cameron and mentioned in the description of that species; Cameron 1881), along with a label in Perkins' handwriting that reads "according to T.B. [Blackburn] this is S. monticola Cam. no. 134," and one saying "R.C.L. Perkins coll." The NHMUK and BPBM specimens are not the same species. Cameron's aculeate Hymenoptera types were not acquired by the NHMUK until 1899 (Lankester 1906), suggesting that Perkins had removed it from Cameron's collection before then. Based on the "134" on the card, I have determined that the BPBM specimen is in fact the holotype of *S. monticola*. It is not entirely clear if the NHMUK specimen is even from the island of Hawai‘i, as it lacks any kind of label, including the symbols that Blackburn used to designate which island specimens came from. It generally matches *S. nigrans*, including in the head dimensions that separate it from *S. monticola*, but differs slightly in having the clypeus more strongly curved in profile, not elongate and acutely pointed. Such a difference could be due to variation or wear.

***Sierola nemorensis* Fullaway, 1920**

Figure 71, Map 15

Sierola nemorensis Fullaway, 1920: 142.

Island. Hawai‘i.

Diagnosis. Part of a large complex of species with a sharp, curved to arched clypeal carina, densely setose basal wing cells, and lateral ocelli distinctly separate from the vertex crest. Separated from *S. fuscipennis* and related species by having the head more compressed (DH/LH 0.54–0.58) and ocellar triangle weakly obtuse, OOL/WOT 1.25–1.45. The vertex and gena setae are also short, similar to those of the frons. Closest to *S. mahana* n. sp., separated by the short antenna (A3 about as long as wide), mandible with a short but distinct concavity just past the base, and basal wing cells less densely setose. Also similar to *S. pakua* n. sp., distinguished by the lateral ocelli being separated from the vertex crest and by having the mandible moderately broad and not strongly concave ventrally (moderately narrow and distinctly concave in *S. pakua*).

Description. **Female**. *Head*. Clypeal process semicircular, apex broadly rounded; dorsally with a sharp carina; in profile evenly curved from base to apex, apical angle slightly acute. Mandible moderately broad, slightly narrowed medially and expanded at apex, ventral margin weakly concave; not twisted, at most weakly convex outwardly, outwardly coriaceous, somewhat dull; in ventral view evenly, moderately curved. Apex of mandible vertical, with equally strong teeth. Malar space very small. Dorsal setae of head about as long as flagellar width or scarcely longer. Frons with distinct, uneven punctures, 1–3 pit widths apart. Vertex and gena setae similar to and only slightly longer than setae of frons. Frons microsculpture dull, granular. Vertex in dorsal view more or less straight; occipital margin broadly rounded. Lateral ocelli distinctly separate from vertex crest by less than ocellus length. Ocellar triangle front angle weakly obtuse. Head more or less parallel-sided for some distance posterior to eyes. Dorsum of head in lateral view slightly convex, head deepest on line through posterior margin of eye. Venter of head posterior to mandible convex in lateral view, with relatively sparse setae. Head evenly convex ventrally, genal angle absent. Postgenal depression very shallow, nearly absent. Antenna extending to anterior margin of pronotum.

Mesosoma. Anterior margin of dorsal pronotal area in lateral view evenly rounded. Pronotal setae longer than flagellar width. Propodeal disc laterally shining, with weak microsculpture; metapleural carinae complete. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with smooth but distinct microreticulation over all terga, or with only very faint microreticulation over posterior terga. Sixth sternum narrowly glabrous medially, laterally with dense pilose setae.

Color. Body entirely dark brown to black. Antenna dark brown dorsally, yellowish brown ventrally. Mandible black. Coxae and femora dark brown to black, tibiae, tarsi, and trochanters yellow.

Wings. Membrane tinged with yellow. Basal cells of fore wing with intermediate setation, each with two complete rows and a few additional setae.

Measurements. LFW 1.92 mm; LM 0.98 mm; WH/LH 0.93 (0.87–0.93); DH/LH 0.57 (0.54–0.57); EV/HE 0.74 (0.72–0.76); EV/WF 0.63 (0.60–0.68); WF/HE 1.17 (1.12–1.20); WH/WF 1.70 (1.68–1.74); OOL/WOT 1.29 (1.29–1.42); DM/LM 0.41; FL/FW 2.08 (2.05–2.18); HFL/HFW 2.22 (2.22–2.47); A3 L/W 1.00 (0.90–1.11). N = 6.

Type Material. Holotype ♀. Hawai‘i: Hawai‘i [no locality or date], A. Koebele, BPBMENT 0000000140.

Material examined: 1♀, Hawai‘i, [no date], A. Koebele, BPBM (paratype). 1♀, Kīlauea, 4,000 ft [1,220 m], dry forest; numbered 12, 12 Jun 1908, W.M. Giffard, BPBM (paratype of *S. fuscipes*). 1♀, Kohala Mts., 24 May 1917, O.H. Swezey, BPBM. 3♀, Honoka‘a, 2,500 ft [760 m], 28 May 1922, F.X. Williams, BPBM. 1♀, Kohala Forest Reserve, 1,158 m, fogging *Metros. polymorpha*, 3–2, GRU 0506–007, 12 Oct 1997, D.S. Gruner & D.A. Polhemus, BPBM.

Distribution. Found in wet forest on the windward side, somewhat rare but found recently in fogging samples.

Sierola neobrunnea n. sp.

Figure 72, Map 14

Island. Hawai‘i.

Diagnosis. The combination of a yellow, narrow mandible that is strongly concave ventrally and strongly convex outwardly on the apical half, and a sharp clypeal carina will separate this species from all others on Hawai‘i. Nearly identical to *S. brunnea* Fullaway of O‘ahu, separated by the sparser setation of the basal wing cells, with only two distinct rows plus a few additional setae.

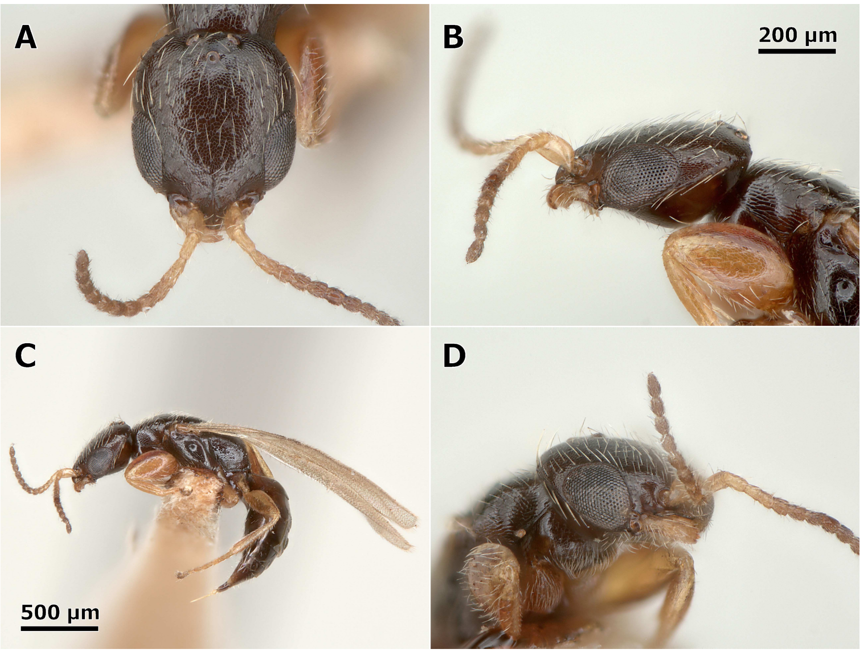


Figure 72. *Sierola neobrunnea*. A: head, dorsal. B: head, lateral. C: lateral habitus. D: head, frontal.

Description. **Female**. *Head*. Clypeal process semi-elliptical, apex broadly rounded; dorsally with a sharp carina; in profile evenly curved from base to apex, apical angle slightly acute. Mandible narrow, expanded at base and apex, ventral margin distinctly concave; apical half of mandible strongly convex outwardly, teeth arrayed on frontal and dorsal surfaces, outwardly coriaceous, somewhat dull; in ventral view evenly, moderately curved. Apex of mandible vertical, with second ventral tooth largest. Malar space almost absent. Dorsal setae of head distinctly longer than flagellar width. Frons with shallow, close punctures, mostly about 1 pit width apart. Vertex and gena setae conspicuous, nearly twice as long as setae of frons and stronger, erect and directed anterior. Frons microsculpture finely microreticulate, surface weakly matte. Vertex in dorsal view more or less straight; occipital margin not carinate but forming a pronounced ridge. Lateral ocelli nearly touching vertex crest. Ocellar triangle front angle right. Head more or less parallel-sided for some distance posterior to eyes. Dorsum of head in lateral view slightly convex, head deepest on line through posterior margin of eye. Venter of head posterior to mandible concave in lateral view, with relatively sparse setae. Head evenly convex ventrally, genal angle absent. Side of head posterior to eye distinctly angulate. Gena ventral to eye flat. Postgenal depression shallow, rounded. Antenna extending to posterior margin of pronotum.

Mesosoma. Anterior margin of dorsal pronotal area in lateral view evenly rounded. Pronotal setae elongate, twice as long as flagellar width or more. Propodeal disc laterally finely, weakly striate; metapleural carinae present posteriorly, fading anteriorly. Fore femur strongly expanded, less than twice as long as wide, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with faint microsculpture laterally. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Body entirely dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible yellow. Legs all yellow.

Wings. Membrane hyaline. Basal cells of fore wing with intermediate setation, each with two complete rows and a few additional setae.

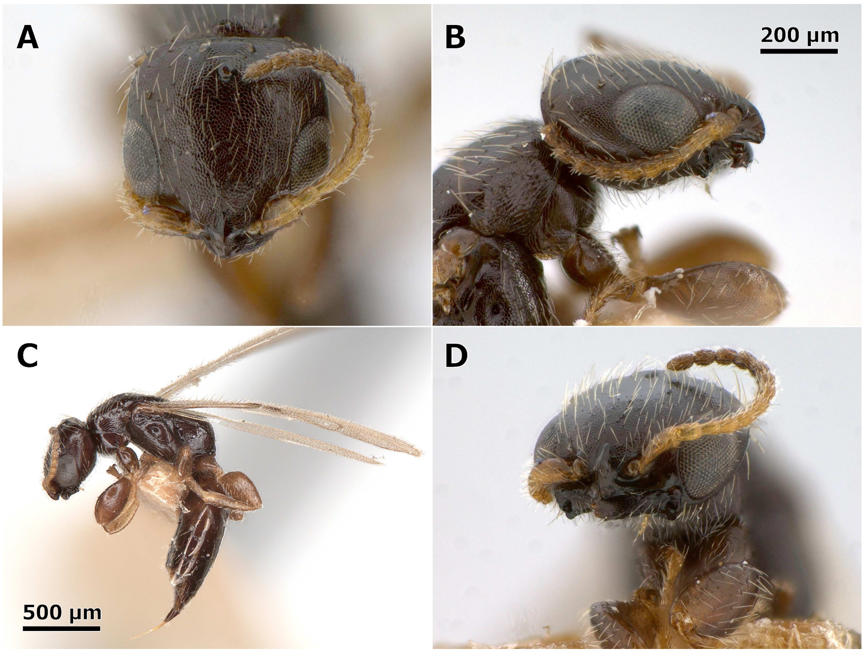


Figure 73. *Sierola newelli*. A: head, dorsal. B: head, lateral. C: lateral habitus. D: head, frontal.

Measurements. LFW 1.82 mm; LM 0.84 mm; WH/LH 0.83 (0.83–0.86); DH/LH 0.54 (0.53–0.54); EV/HE 0.90 (0.80–0.90); EV/WF 0.76 (0.68–0.76); WF/HE 1.19 (1.15–1.25); WH/WF 1.62 (1.62–1.68); OOL/WOT 1.46 (1.36–1.46); DM/LM 0.42; FL/FW 1.86 (1.83–1.93); HFL/HFW 2.62 (2.55–2.90); A3 L/W 1.14 (1.14–1.22); 2R1 L/W 2.88. N = 4.

Type Material. Holotype ♀. Hawai‘i: Niuli‘i, 22 May 1917, O.H. Swezey, BPBMENT 0000018114. Paratypes: 1♀, Kīlauea, Aug 1896, R.C.L. Perkins, BPBM. 1♀, S. Kona, *Straussia* [= *Psychotria*], 8 Aug 1919, O.H. Swezey, BPBM. 1♀, Honoka‘a, 2,500 ft [760 m], 28 May 1922, F.X. Williams, BPBM.

Additional (non-type) material: 1♀, Kukuiopa‘e, 4,600 ft [1,400 m], 19.3033°N 155.8189°W, on *Clermontia* leaves, 11 Sep 2010, K.N. Magnacca, KNMC.

Etymology. Referring to the close similarity between this species and *S. brunnea* Fullaway of O‘ahu.

Distribution. Widespread but rare, known from five specimens scattered across the island, one of them recent.

Discussion. This may eventually prove to be conspecific with *S. brunnea*, but despite the wide variability in head width, punctation, and color seen in that species, the dense wing setation is consistent. In contrast, the few available specimens of *S. neobrunnea* are not particularly variable despite coming from widely separated locations.

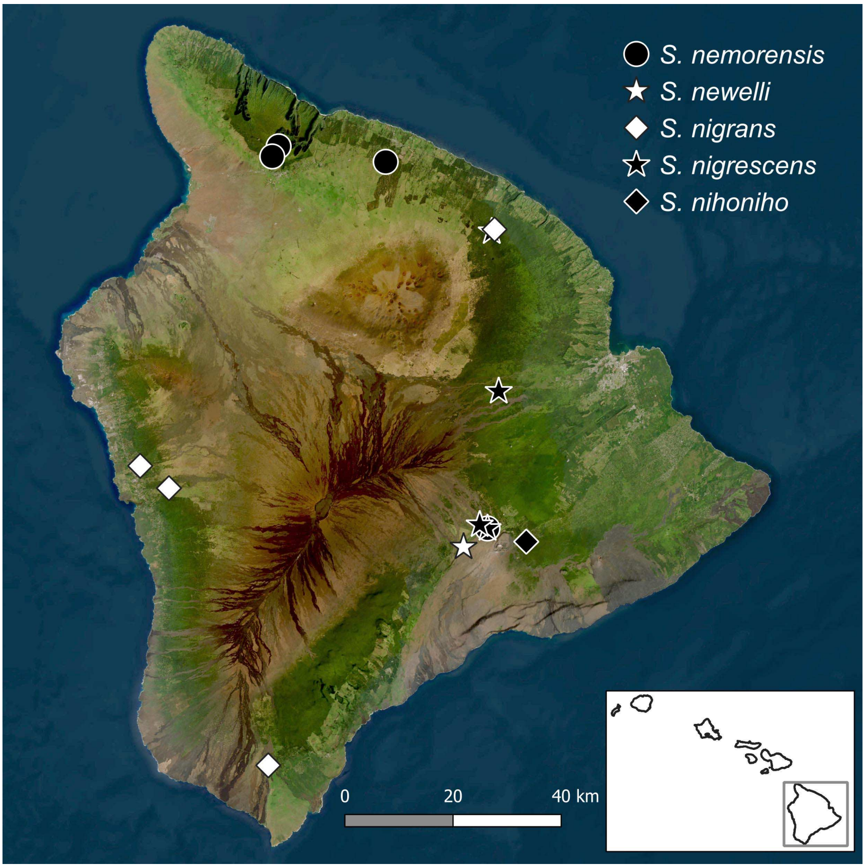
***Sierola newelli* Fullaway, 1920**

Figure 73, Map 15

Sierola newelli Fullaway, 1920: 154.

Island. Hawai‘i.

Diagnosis. Part of a large complex of species with a sharp, curved to arched clypeal carina, densely setose basal wing cells, lateral ocelli distinctly separate from the vertex crest, and head deep (DH/LH ≥0.59). Separated by having the frons moderately punctate with coriaceous sculpture (not strongly dull and densely punctate), and vertex and gena



Map 15. Collection localities of *Sierola nemorensis, S. newelli, S. nigrans, S. nigrescens*, and *S. nihoniho*.

setae elongate and conspicuous. Closest to *S. levigata* Fullaway, distinguished by having A3 slightly wider than long and the hind femur broader (HFL/HFW ~1.90–2.30).

Description. **Female**. *Head*. Clypeal process semicircular, apex broadly rounded; dorsally with a sharp carina; in profile strongly arched, vertical or slightly recurved at apex, carina extending above antennal sockets. Mandible moderately narrow, slightly narrowed medially from base, ventral margin weakly concave; not twisted, at most weakly convex outwardly, outwardly coriaceous, somewhat dull; in ventral view weakly curved. Apex of mandible vertical, with equally strong teeth. Malar space almost absent. Dorsal setae of head distinctly longer than flagellar width. Frons with shallow, uneven punctures, 1–3 pit widths apart. Vertex and gena setae conspicuous, nearly twice as long as setae of frons and stronger, erect and directed anterior. Frons microsculpture coriaceous, matte but without strong surface texture. Vertex in dorsal view more or less straight; occipital margin broadly rounded. Lateral ocelli distinctly separate from vertex crest by less than ocellus length. Ocellar triangle front angle weakly acute. Head more or less parallel-sided for some distance posterior to eyes. Dorsum of head in lateral view slightly convex, head deepest on line through posterior margin of eye. Venter of head posterior to mandible convex in lateral view, with relatively sparse setae. Head evenly convex ventrally, genal angle absent. Postgenal depression very shallow, nearly absent. Antenna extending to anterior margin of pronotum.

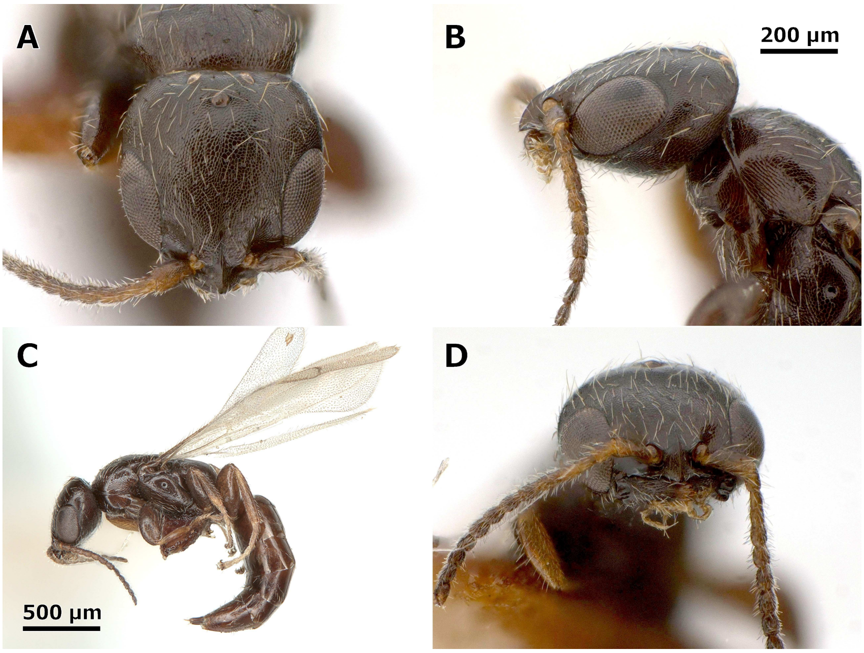


Figure 74. *Sierola nigrans*. A: head, dorsal. B: head, lateral. C: lateral habitus. D: head, frontal.

Mesosoma. Anterior margin of dorsal pronotal area in lateral view evenly rounded. Pronotal setae longer than flagellar width. Propodeal disc laterally finely, weakly striate; metapleural carinae complete. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Highly polished, without a trace of microsculpture. Sixth sternum broadly glabrous medially, with sparse setae laterally.

Color. Body entirely dark brown to black. Antenna dark brown dorsally, yellowish brown ventrally. Mandible black. Coxae and femora dark brown to black, fore tibia and tarsi yellow, mid and hind tibiae brown with yellow bands at bases and apices.

Wings. Membrane tinged with yellow. Basal cells of fore wing densely and conspicuously setose.

Measurements. LFW 1.98 mm; LM 0.92 mm; WH/LH 0.93; DH/LH 0.59; EV/HE 0.79; EV/WF 0.59; WF/HE 1.35; WH/WF 1.61; OOL/WOT 1.48; DM/LM 0.43; FL/FW 1.96; HFL/HFW 2.00; A3 L/W 1.11.

Type Material. Holotype ♀. Hawai‘i: Ka‘ū, 3,600 ft [1,100 m], on ‘a‘ā flows, 18 Jul 1918, W.M. Giffard, BPBMENT 0000000164.

Distribution. Known only from the holotype, collected in 1918 in Ka‘ū.

Discussion. See comments under *S. fuscipennis*.

Sierola nigrans Fullaway, 1920

Figure 74, Map 15

Sierola nigrans Fullaway, 1920: 133.

Island. Hawai‘i.

Diagnosis. Part of the large group of species with a sharp, evenly curved clypeal carina and densely setose basal wing cells. A distinctive species, easily recognized by the strongly sculpted and punctate metasoma. Very similar to *S. monticola* Blackburn & Cameron, separated by having the head more compact, deeper and shorter behind the eyes (DH/LH ~0.55, EV/HE 0.60–0.70), and evenly convex ventrally. Among others only *S. opakapaka* n. sp. has the metasoma distinctly coriaceous; in that species the head is much deeper, DH/LH ≥0.60.

Description. **Female**. *Head*. Clypeal process rounded triangular, apex weakly pointed; dorsally with a sharp carina; in profile evenly curved from base to apex, apical angle slightly acute, or elongate, evenly curved, apex acute. Mandible narrow, slightly expanded at base and apex, ventral margin weakly concave; apical half of mandible strongly convex outwardly, teeth arrayed on frontal and dorsal surfaces, outwardly coriaceous, somewhat dull; in ventral view weakly curved. Apex of mandible vertical, with equally strong teeth. Malar space very small. Dorsal setae of head distinctly longer than flagellar width. Frons with shallow, uneven punctures, 1–3 pit widths apart. Vertex and gena setae conspicuous, nearly twice as long as setae of frons and stronger, erect and directed anterior. Frons microsculpture coriaceous, matte but without strong surface texture. Vertex in dorsal view more or less straight; occipital margin broadly rounded. Lateral ocelli nearly touching vertex crest. Ocellar triangle front angle weakly obtuse. Head more or less parallel-sided for some distance posterior to eyes. Dorsum of head in lateral view slightly convex, head deepest on line through eye. Venter of head posterior to mandible flat in lateral view, with relatively sparse setae. Head evenly convex ventrally, genal angle absent. Postgenal depression very shallow, nearly absent. Antenna extending to posterior margin of pronotum.

Mesosoma. Anterior margin of dorsal pronotal area in lateral view evenly rounded. Pronotal setae longer than flagellar width. Propodeal disc laterally shining, with weak microsculpture; metapleural carinae nearly absent, visible only beyond propodeal declivity. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Punctate and coriaceous, with distinct microreticulation. Sixth sternum evenly covered with short, anteriorly-directed setae.

Color. Body entirely dark brown to black. Antenna entirely dark brown to black. Mandible black. Coxae and femora dark brown to black, tibiae dark brown, trochanters, tarsi, and bands at bases and apices of tibiae orange.

Wings. Membrane tinged with yellow. Basal cells of fore wing densely and conspicuously setose.

Measurements. LFW 1.91 mm; LM 0.93 mm; WH/LH 0.91 (0.90–0.92); DH/LH 0.55 (0.55–0.57); EV/HE 0.73 (0.63–0.73); EV/WF 0.64 (0.53–0.64); WF/HE 1.14 (1.09–1.17); WH/WF 1.72 (1.68–1.75); OOL/WOT 1.24 (1.09–1.24); DM/LM 0.43; FL/FW 1.93 (1.85–2.05); HFL/HFW 2.08 (2.00–2.08); A3 L/W 1.17 (1.13–1.51). N = 5.

Type Material. Holotype ♀. Hawai‘i: Kahuku, 1,800 ft [550 m], 14 Jan 1919, W.M. Giffard, BPBMENT 0000000122.

Material examined: 1♀ [no collection data, “Sierola monticola Cam Hawaii” on underside of card, bearing red-ringed type label and B.M. TYPE 13.191], NHMUK. 1♀, Kona, 2,000 ft [600 m], 30 Jun 1892, R.C.L. Perkins, BPBM [right specimen on card]. 1♀, Kealakekua, 3,500 ft [1,070 m], on *Clermontia coerulea* [= *C. clermontioides*], 16 Aug 1919, P.H. Timberlake, UCRC ENT 556762. 1♀, No. Hilo Dist., Laupāhoehoe Natural Area Reserve, 28 Oct 1996, M.J. & C.A. Tauber, BPBM.

Distribution. Rare but widespread in wet to mesic forest. Known only from the type, an old specimen lacking data at NHMUK, two older specimens from Kona, and one recent specimen from Laupāhoehoe.

Discussion. See comments under *S. monticola*.

Sierola nigrescens Fullaway, 1920

Figure 75, Map 15

Sierola nigrescens Fullaway, 1920: 73.

Island. Hawai‘i.

Diagnosis. Distinguished from all other species on Hawai‘i by the mandible being bent down near the base and overlapping in an X when closed, along with the flat, quadrate

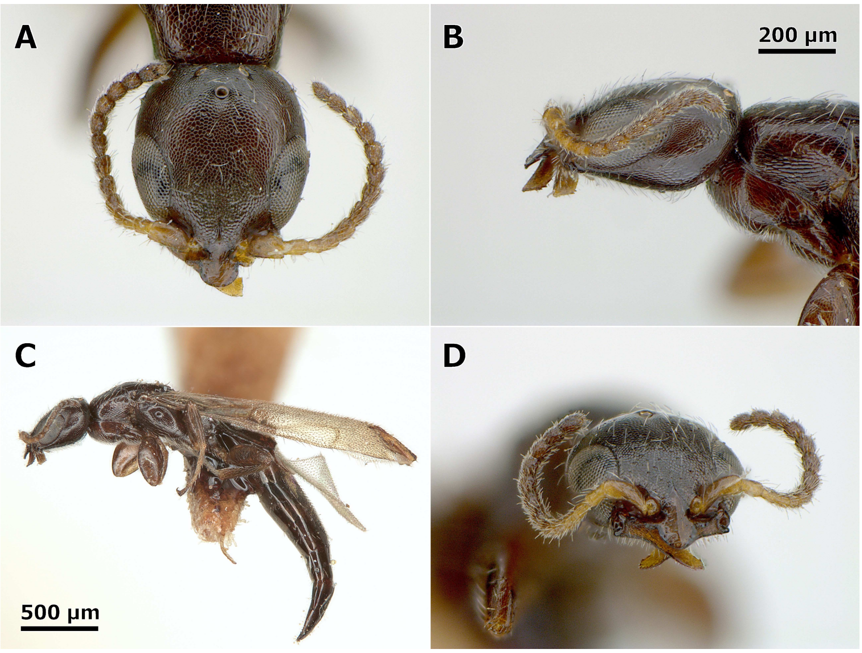


Figure 75. *Sierola nigrescens*. A: head, dorsal. B: head, lateral. C: lateral habitus. D: head, frontal.

clypeus. Very similar to *S. psaliphora* Magnacca from Oʻahu, differing in having the mandible less strongly bent and frons more coarsely sculpted and sparsely punctate.

Description. **Female**. *Head*. Clypeal process spatulate, expanded beyond anterior margin of head, apex broadly rounded; dorsally flat, with a trace of a low carina basally; in profile slightly sloping at base, apical portion horizontal. Mandible very thin, laminate, scissors-like; distinctly bent down near base, crossing diagonally when closed, outwardly polished, smooth, shining; in ventral view straight or nearly so. Apex of mandible strongly oblique, truncate, lacking teeth. Malar space almost absent. Dorsal setae of head about as long as flagellar width or scarcely longer. Frons with sparse, scattered punctures, mostly 3 pit widths apart or more. Vertex and gena setae similar to and only slightly longer than setae of frons. Frons microsculpture dull, granular. Vertex in dorsal view more or less straight; occipital margin broadly rounded. Lateral ocelli nearly touching vertex crest. Ocellar triangle front angle weakly acute. Head narrowed posterior to eyes. Dorsum of head in lateral view slightly convex, head deepest on line through posterior margin of eye. Venter of head posterior to mandible flat in lateral view, with moderately dense pubescence. Head evenly convex ventrally, genal angle absent. Postgenal depression shallow, rounded. Antenna extending to posterior margin of pronotum.

Mesosoma. Anterior margin of dorsal pronotal area in lateral view evenly rounded. Pronotal setae longer than flagellar width. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Highly polished, without a trace of microsculpture.

Color. Body entirely dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible reddish brown. Fore coxa and femur black, legs otherwise brown, paler towards tarsi.

Wings. Membrane tinged with yellow. Basal cells of fore wing densely and conspicuously setose.

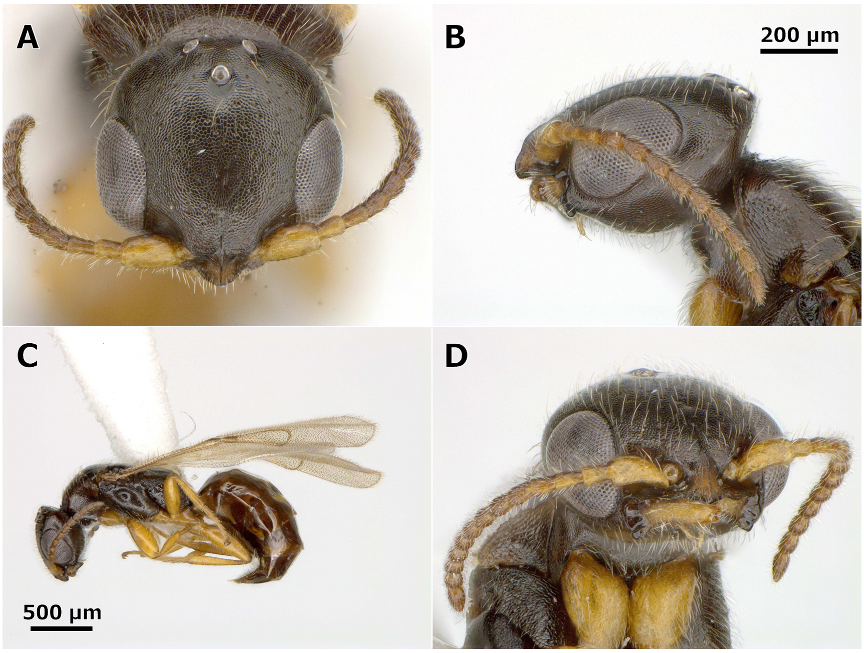


Figure 76. *Sierola nihoniho*. A: head, dorsal. B: head, lateral. C: lateral habitus. D: head, frontal.

Measurements. LFW 1.91 mm; LM 0.84 mm; WH/LH 0.78; DH/LH 0.50; EV/HE 0.70; EV/WF 0.70; WF/HE 1.00; WH/WF 1.80; OOL/WOT 1.50; DM/LM 0.41; FL/FW 2.07; A3 L/W 1.00.

Type Material. Holotype ♀. Hawai‘i: Kīlauea, 4,000 ft [1,220 m], in the dry forest, 6 Jul 1918, W.M. Giffard, BPBMENT 0000000003.

Material examined: 1♀, Laupāhoehoe Forest Reserve, 1,219 m, fogging *Metros. polymorpha*, A3A-5, GRU 4262–001, 4 Jun 1997, D.S. Gruner, BPBM. 1♀, Upper Waiākea Forest Reserve, 1,280 m, clipping *Metros. polymorpha*, 27-B, GRU 7620–001, 17 Apr 2001, D.S. Gruner, BPBM. 1♀, Kīpuka Kī, yellow sticky card, site #14, card G, 2 May 2003, BPBM.

Distribution. Rarely collected, known only from the holotype and three recent specimens, all from the windward side of the island.

Discussion. Two of the recent specimens were collected by fogging or branch clipping ‘ōhi‘a lehua (*Metrosideros polymorpha*) canopy, the same method by which a large number of a related species was collected on Maui, suggesting that this species may not be rare but difficult to collect.

Sierola nihoniho n. sp.

Figure 76, Map 15

Island. Hawai‘i.

Diagnosis. Part of the species group with a sharp, rather strongly arched clypeal carina, densely setose basal wing cells, and mandible yellow. Closest to *S. imparata* Fullaway and *S. lepida* Fullaway, distinguished by having the occipital margin narrowed to a ridge, posterior corners of the head strongly rounded (head thus appearing more circular rather than quadrate in dorsal view), and the head very broad, WH/LH ~0.99. The clypeus is also peculiarly scalloped or crenulate in lateral view, though this may be an aberration of the single specimen.

Description. **Female**. *Head*. Clypeal process semi-elliptical, apex rounded; dorsally with a sharp carina; in profile evenly curved generally, slightly crenulate in lateral view. Mandible moderately narrow, slightly narrowed medially from base, ventral margin weakly concave; not twisted, at most weakly convex outwardly, outwardly coriaceous, somewhat dull; in ventral view evenly, moderately curved. Apex of mandible vertical, with equally strong teeth. Malar space very small. Dorsal setae of head about as long as flagellar width or scarcely longer. Frons with shallow, uneven punctures, 1–3 pit widths apart. Vertex and gena setae similar to and only slightly longer than setae of frons. Frons microsculpture coriaceous, matte but without strong surface texture. Vertex in dorsal view more or less straight, corners strongly rounded off; occipital margin not carinate but forming a pronounced ridge. Lateral ocelli nearly touching vertex crest. Ocellar triangle front angle strongly acute. Head rounded shortly posterior to eyes. Dorsum of head in lateral view strongly convex, head deepest on line through eye. Venter of head posterior to mandible convex in lateral view, with relatively sparse setae. Head evenly convex ventrally, genal angle absent. Postgenal depression very shallow, nearly absent. Antenna extending to pronotum.

Mesosoma. Anterior margin of dorsal pronotal area in lateral view almost evenly sloping, weakly curved. Pronotal setae longer than flagellar width. Propodeal disc laterally coarsely striate; median carina faintly present; metapleural carinae complete. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with faint microsculpture laterally. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Body entirely dark brown to black, clypeus orange to yellow. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible yellow except black near articulation. Legs all yellow except dorsal margins of femora tinged with brown.

Wings. Membrane hyaline. Basal cells of fore wing densely and conspicuously setose. Cell 1M distinctly convex posteriorly, corner medioapical. Distal portion of vein Rs strongly curved, meeting anterior wing margin at oblique angle.

Measurements. LFW 2.30 mm; LM 1.10 mm; WH/LH 0.99; DH/LH 0.64; EV/HE 0.61; EV/WF 0.52; WF/HE 1.18; WH/WF 1.69; OOL/WOT 1.09; DM/LM 0.41; FL/FW 1.97; HFL/HFW 2.71; A3 L/W 1.57; 2R1 L/W 2.68.

Type Material. Holotype ♀. Hawai‘i: Hawaii Volcanoes National Park, 1,200 m, fogging *Metros. polymorpha*, 7–4, GRU 1085–002, 7 Oct 1997, D.S. Gruner & D.A. Polhemus, BPBMENT 0000018115.

Etymology. From the Hawaiian *nihoniho*, jagged or scalloped, referring to the appearance of the clypeal carina in lateral view.

Distribution. Known only from the holotype, collected in wet forest at Kīlauea.

Discussion. The unusual crenulate shape of the clypeal carina may be an aberration, but only one specimen is available.

Sierola nukupio **n**. **sp**.

Figure 77, Map 16

Island. Hawai‘i.

Diagnosis. Part of a complex of species with a sharp, evenly curved clypeal carina, broad head, long third antennal segment, and sparsely setose to glabrous basal wing cells. Very similar to *S. puuwaawaa* Fullaway, differing most clearly in the glabrous basal wing cells; it also differs from most specimens of that species by the yellow mandible, slightly more prominent clypeus, longer head setation, and narrow hind femur.

Description. **Female**. *Head*. Clypeal process semicircular, apex rounded; dorsally with a sharp carina; in profile evenly curved from base to apex, apical angle slightly acute. Mandible moderately narrow, slightly narrowed medially from base, ventral margin weakly concave; apical half of mandible strongly convex outwardly, teeth arrayed on frontal and dorsal surfaces, outwardly coriaceous, somewhat dull; in ventral view evenly, moderately curved. Apex of mandible vertical, with teeth distinctly stronger ventrally. Malar space very

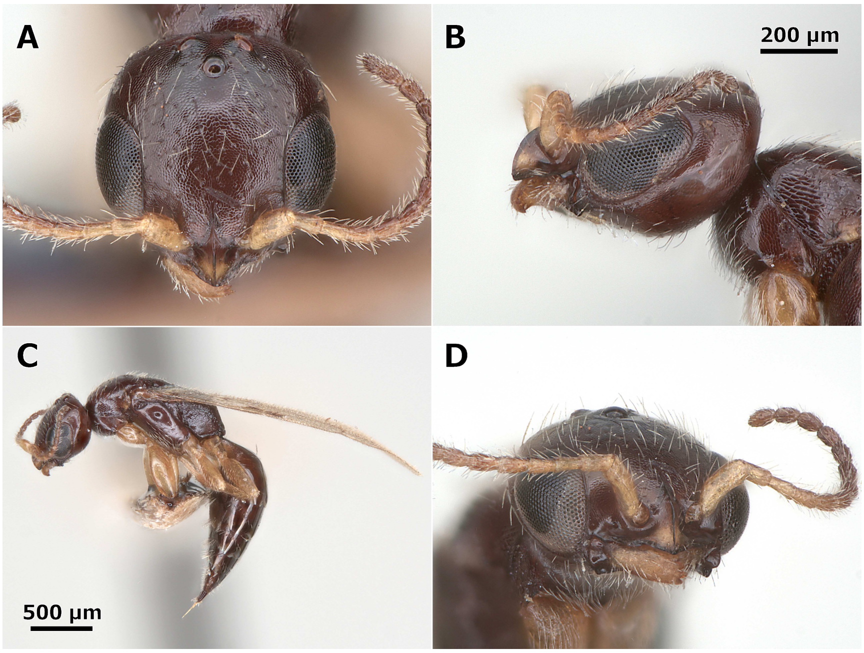


Figure 77. *Sierola nukupio*. A: head, dorsal. B: head, lateral. C: lateral habitus. D: head, frontal.

small. Dorsal setae of head distinctly longer than flagellar width. Frons with shallow, uneven punctures, 1–3 pit widths apart. Vertex and gena setae distinctly longer than frons setae but only about as thick, not particularly conspicuous. Frons microsculpture coriaceous, matte but without strong surface texture. Vertex in dorsal view more or less straight; occipital margin narrowly rounded. Lateral ocelli nearly touching vertex crest. Ocellar triangle front angle weakly acute. Head rounded shortly posterior to eyes. Dorsum of head in lateral view strongly convex, head deepest on line through eye. Venter of head posterior to mandible convex in lateral view, with relatively sparse setae. Head evenly convex ventrally, genal angle absent. Postgenal depression very shallow, nearly absent. Antenna extending to posterior margin of pronotum.

Mesosoma. Anterior margin of dorsal pronotal area in lateral view evenly rounded. Pronotal setae elongate, twice as long as flagellar width or more. Propodeal disc laterally coarsely striate; metapleural carinae complete. Fore femur only moderately expanded, more than twice as long as wide, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with faint microsculpture laterally. Sixth sternum narrowly glabrous medially, laterally with dense pilose setae.

Color. Body entirely dark brown to black, clypeus orange to yellow. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible yellow except black near articulation. Legs all yellow.

Wings. Membrane hyaline. Basal cells of fore wing nearly glabrous, with only few scattered setae. Cell 1M weakly convex posteriorly, corner posteroapical.

Measurements. LFW 2.49 mm; LM 1.21 mm; WH/LH 0.95 (0.90–0.95); DH/LH 0.62 (0.58–0.63); EV/HE 0.59 (0.57–0.64); EV/WF 0.51 (0.53–0.59); WF/HE 1.15 (1.05–1.15); WH/WF 1.72 (1.72–1.82); OOL/WOT 1.09 (1.03–1.12); DM/LM 0.41; FL/FW 2.45 (2.43–2.56); HFL/HFW 2.81 (2.75–2.81); A3 L/W 1.61 (1.57–1.67); 2R1 L/W 2.7. N = 4.

Type Material. Holotype ♀. Hawai‘i: S. Kona, *Cheirodendron*, 16 Aug 1919, O.H. Swezey, BPBMENT 0000018116. Paratypes: 1♀, S. Kona, *Pipturus*, 16 Aug 1919, O.H. Swezey, BPBM. 2♀, 29 mi. ‘Ōla‘a, Aug 1925, W.M. Giffard, BPBM.

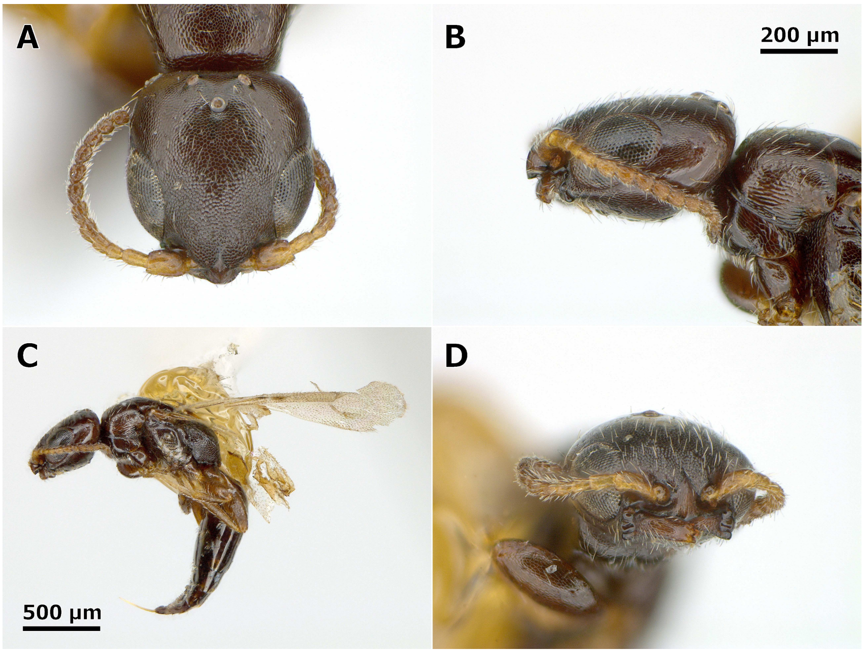


Figure 78. *Sierola okala*. A: head, dorsal. B: head, lateral. C: lateral habitus. D: head, frontal.

Etymology. From the Hawaiian *nuku*, beak, + *pi'o*, arched, referring to the strongly curved clypeus.

Distribution. Rare, known from four specimens collected in wet forest, two each from South Kona and ʻŌlaʻa. Last seen in 1925.

Discussion. See comments under *S. puuwaawaa*.

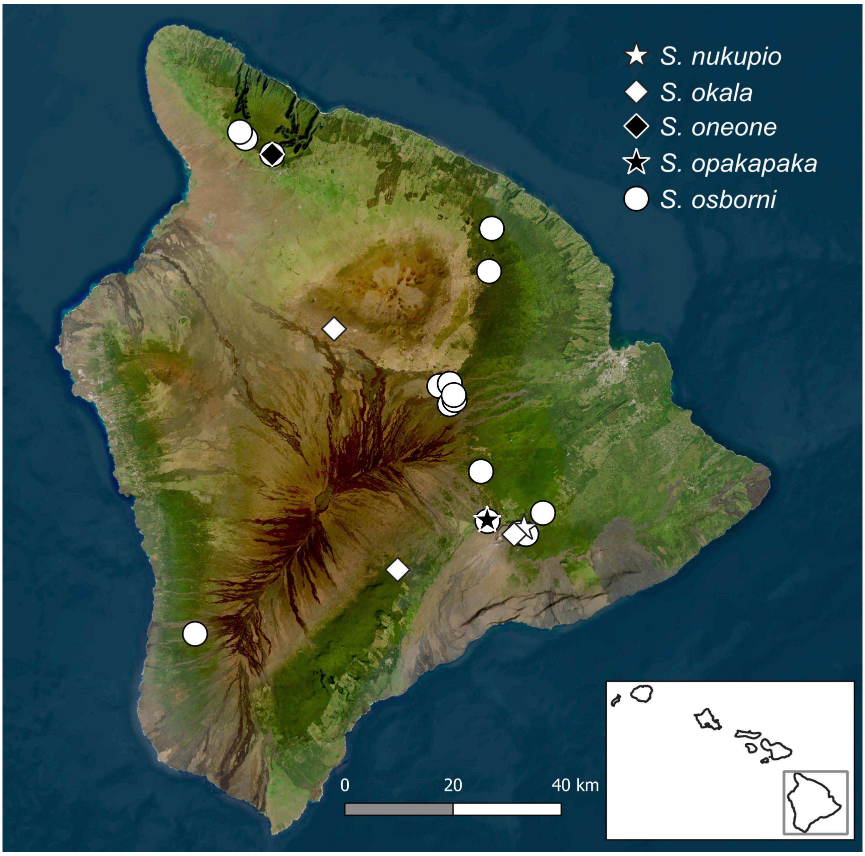
Sierola okala n. sp.

Figure 78, Map 16

Island. Hawaiʻi.

Diagnosis. Readily distinguished from all other species by the heterogeneous frons microsculpture, minutely colliculate below the middle of the eyes and finely microreticulate above. Otherwise somewhat nondescript, clypeus short and curved, weakly carinate dorsally, head moderately broad and deep, mandible moderately narrow and parallel-sided. Closest to *S. hou* n. sp., which is distinguished by having the microsculpture scutellate (each cellule flat) and covering the entire frons; and the head more strongly convex dorsally and ventrally, with the posterior corners more rounded.

Description. **Female**. *Head*. Clypeal process semi-elliptical, apex broadly rounded; dorsally weakly carinate; in profile steep and short, evenly curved to evenly curved from base to apex, apical angle slightly acute. Mandible moderately narrow, more or less parallel-sided except at base; not twisted, at most weakly convex outwardly, outwardly coriaceous, somewhat dull; in ventral view weakly curved. Apex of mandible vertical, with equally strong teeth. Malar space very small. Dorsal setae of head about as long as flagellar width or scarcely longer. Frons with shallow, uneven punctures, 1–3 pit widths apart. Vertex and gena setae similar to and only slightly longer than setae of frons. Frons microsculpture minutely colliculate anterior of middle of eyes, finely microreticulate posteriorly. Vertex in dorsal view more or less straight; occipital margin broadly rounded. Lateral ocelli distinctly



Map 16. Collection localities of *Sierola nukupio, S. okala, S. oneone, S. opakapaka*, and *S. osborni*.

separate from vertex crest by less than ocellus length. Ocellar triangle front angle right. Head more or less parallel-sided for some distance posterior to eyes. Dorsum of head in lateral view slightly convex, head deepest on line through posterior margin of eye. Venter of head posterior to mandible convex in lateral view, with relatively sparse setae. Head evenly convex ventrally, genal angle absent. Postgenal depression very shallow, nearly absent. Antenna extending to pronotum.

Mesosoma. Anterior margin of dorsal pronotal area in lateral view evenly rounded. Pronotal setae longer than flagellar width. Propodeal disc laterally coarsely rugulose; metapleural carinae complete. Fore femur only moderately expanded, more than twice as long as wide, with both anterior and posterior surfaces convex, not strongly compressed, more or less straight in dorsal view.

Metasoma. Highly polished, without a trace of microsculpture. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Body entirely dark brown to black. Antenna entirely dark brown except ventral side of basal segments yellowish. Mandible black to orange. Coxae and femora dark brown to black, fore femur sometimes predominantly pale; fore tibia and tarsi yellow, mid and hind tibiae brown with yellow bands at bases and apices.

Wings. Membrane hyaline. Basal cells of fore wing with intermediate setation, each with two complete rows and a few additional setae. Cell 1M weakly convex posteriorly, corner posteroapical.

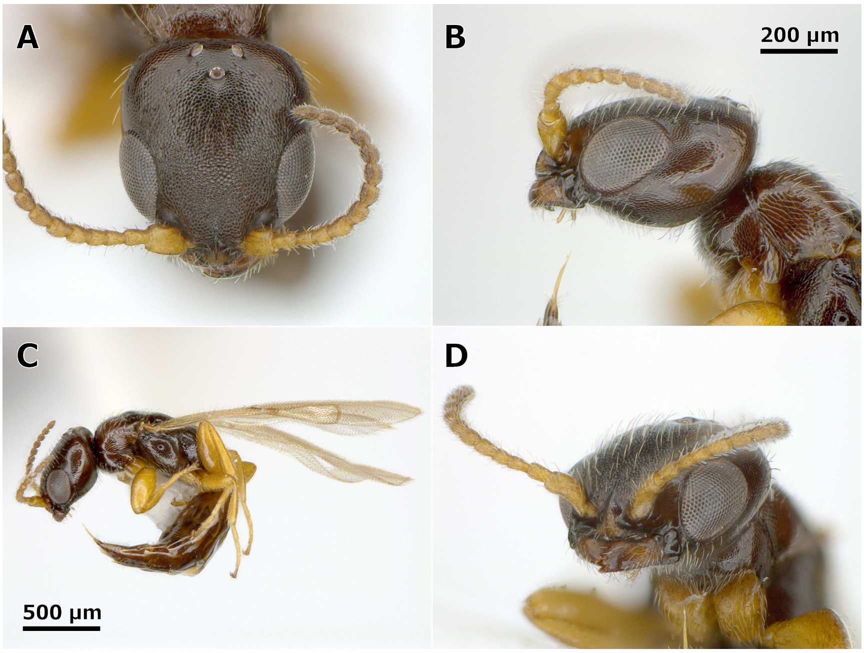


Figure 79. *Sierola oneone*. A: head, dorsal. B: head, lateral. C: lateral habitus. D: head, frontal.

Measurements. LFW 1.65 mm; LM 0.85 mm; WH/LH 0.88 (0.85–0.88); DH/LH 0.58 (0.57–0.58); EV/HE 0.72 (0.65–0.72); EV/WF 0.67 (0.65–0.72); WF/HE 1.08 (1.08–1.21); WH/WF 1.74 (1.67–1.74); OOL/WOT 1.20 (1.20–1.65); DM/LM 0.48; FL/FW 2.23 (2.23–2.56); HFL/HFW 2.53 (2.53–2.91); A3 L/W 1.20 (1.20–1.42); 2R1 L/W 2.56. N = 3.

Type Material. Holotype ♀. Hawai‘i: Kīlauea, Byron's Ledge, 12 Jul 1934, O.H. Swezey, BPBMENT 0000018117. Paratype: 1♀, Pōhakuloa, 26 Jun 1963, D.E. Hardy, BPBM.

Additional (non-type) material: 1♀, Kapāpala Canoe Management Area, 1,390 m, 19.3560°N 155.4610°W, on *Myrsine lessertiana*, 10 Apr 2023, K.N. Magnacca, BPBM.

Etymology. From the Hawaiian *‘ōkala*, rough (as sharkskin), referring to the colliculate lower frons.

Distribution. Known from only three specimens, one taken at Pōhakuloa, one at Kīlauea, and one in Ka‘ū, but last collected in 2023.

Discussion. Only a handful of other Hawaiian species have such unusual microsculpture, and in these it is even across the dorsum of the head; mixed sculpting is found only in a few undescribed Australian species, which differ significantly (*S. panoa* n. sp. also has mixed microsculpture but it is the usual coriaceous type). The paratype from Pōhakuloa has the clypeus slightly more protruding, but the overall structure matches including the distinctive frons sculpture. They appear to represent the extremes of the typical range of variation. The specimen from Kapāpala has the ocellar triangle much narrower (OOL/WOT 1.65), mandible reddish, and fore femur mostly yellow, and may represent a separate species; it is not designated as a paratype.

***Sierola oneone* n. sp.**

Figure 79, Map 16

Island. Hawai‘i.

Diagnosis. Among species with a sharp clypeal carina and densely setose basal wing cells, easily recognized by the moderately broad, reddish brown mandible; clypeus short, very broadly rounded apically, and steeply curved in profile; and vertex straight in dorsal view, not notched. Closest to *S. suttoniae* Fullaway of O‘ahu, separated by having the mandible not twisted and head not so strongly convex ventrally.

Description. **Female**. *Head*. Clypeal process semi-elliptical, apex broadly rounded; dorsally with a sharp carina; in profile steep and short, evenly curved. Mandible moderately broad, more or less parallel-sided except at base; not twisted, at most weakly convex outwardly, outwardly coriaceous, somewhat dull; in ventral view evenly, moderately curved. Apex of mandible slightly oblique, with equally strong teeth. Malar space very small. Dorsal setae of head about as long as flagellar width or scarcely longer. Frons with shallow, uneven punctures, 1–3 pit widths apart. Vertex and gena setae similar to and only slightly longer than setae of frons. Frons microsculpture dull, granular. Vertex in dorsal view more or less straight; occipital margin broadly rounded. Lateral ocelli separated from vertex crest by about their own length. Ocellar triangle front angle weakly acute. Head more or less parallel-sided for some distance posterior to eyes. Dorsum of head in lateral view slightly convex, head deepest on line through posterior margin of eye. Venter of head posterior to mandible convex in lateral view, with relatively sparse setae. Head evenly convex ventrally, genal angle absent. Postgenal depression shallow, rounded. Antenna extending to pronotum.

Mesosoma. Anterior margin of dorsal pronotal area in lateral view evenly rounded. Pronotal setae about as long as flagellar width or scarcely longer. Propodeal disc laterally finely, weakly striate; metapleural carinae complete. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Highly polished, without a trace of microsculpture. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Body entirely dark brown to black, clypeus orange to yellow. Antenna dark brown dorsally, yellowish brown ventrally. Mandible reddish brown. Legs all yellow except dorsal margins of femora tinged with brown.

Wings. Membrane tinged with yellow. Basal cells of fore wing densely and conspicuously setose.

Measurements. LFW 1.76 mm; LM 0.84 mm; WH/LH 0.85; DH/LH 0.56; EV/HE 0.95; EV/WF 0.76; WF/HE 1.25; WH/WF 1.64; OOL/WOT 1.65; DM/LM 0.44; FL/FW 2.14; HFL/HFW 2.55; A3 L/W 1.33; 2R1 L/W 2.89.

Type Material. Holotype ♀. Hawai‘i: Kohala Forest Reserve, 1,158 m, fogging *Metros. polymorpha*, 3–4, GRU 0521–002, 12 Oct 1997, D.S. Gruner & D.A. Polhemus, BPBMENT 0000018118.

Etymology. From the Hawaiian *oneone*, sandy or gritty, referring to the extremely dull and coarse sculpture of the frons.

Distribution. Known only from the holotype, collected in wet forest in Kohala.

***Sierola opakapaka* n. sp.**

Figure 80, Map 16

Island. Hawai‘i.

Diagnosis. Part of a large complex of species with a sharp, curved to arched clypeal carina, densely setose basal wing cells, and lateral ocelli distinctly separate from the vertex crest. Immediately distinguished by the distinct coriaceous sculpture of the metasomal terga. Closest to *S. fuscipennis* in having the frons granular and closely punctate, additionally differing in the elongate vertex and gena setae and longer A3. The head is also deep but OOL/WOT low (~1.30), a combination only found among related species in *S. compacta*, which has the mandible narrow. The only other Hawai‘i species with the metasoma strongly sculpted are the species pair *S. monticola* and *S. nigrans*, both of which have the head much more compressed.

Description. **Female**. *Head*. Clypeal process semicircular, apex broadly rounded to weakly pointed; dorsally with a sharp carina; in profile strongly arched, vertical or slightly recurved at apex, carina extending above antennal sockets. Mandible moderately broad,

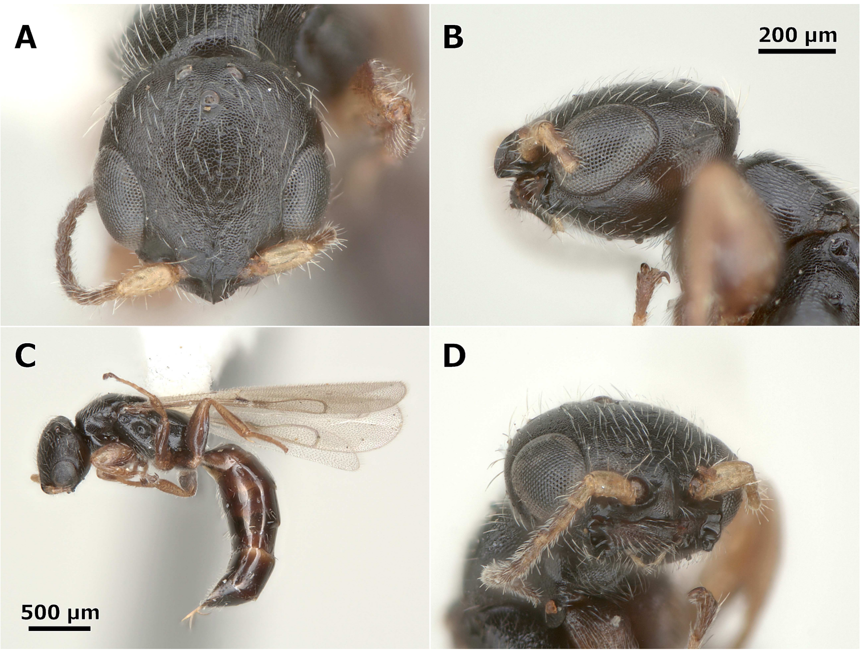


Figure 80. *Sierola opakapaka*. A: head, dorsal. B: head, lateral. C: lateral habitus. D: head, frontal.

slightly narrowed medially and expanded at apex, ventral margin weakly concave; apical half of mandible strongly convex outwardly, teeth arrayed on frontal and dorsal surfaces, outwardly coriaceous, somewhat dull; in ventral view obtusely elbowed. Apex of mandible vertical, with equally strong teeth. Malar space very small. Dorsal setae of head distinctly longer than flagellar width. Frons with shallow, close punctures, mostly about 1 pit width apart. Vertex and gena setae distinctly longer than frons setae but only about as thick, not particularly conspicuous. Frons microsculpture dull, granular. Vertex in dorsal view more or less straight; occipital margin broadly rounded. Lateral ocelli distinctly separate from vertex crest by less than ocellus length. Ocellar triangle front angle weakly acute. Head narrowed posterior to eyes. Head deepest on line through eye. Venter of head posterior to mandible convex in lateral view, with moderately dense pubescence. Head evenly convex ventrally, genal angle absent. Postgenal depression very shallow, nearly absent. Antenna extending to mesonotum.

Mesosoma. Anterior margin of dorsal pronotal area in lateral view weakly angulate. Pronotal setae longer than flagellar width. Propodeal disc laterally finely, weakly striate; metapleural carinae nearly absent, visible only beyond propodeal declivity. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Entirely coriaceous, both terga and sterna microreticulate. Sixth sternum glabrous medially, with sparse setae laterally.

Color. Body entirely dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible black. Coxae and mid and hind femora dark brown to black, fore femur broadly yellow medially, dark brown on dorsal and ventral margins, tibiae, tarsi, and trochanters yellow.

Wings. Membrane hyaline. Basal cells of fore wing densely and conspicuously setose. Cell 1M weakly convex posteriorly, corner posteroapical.

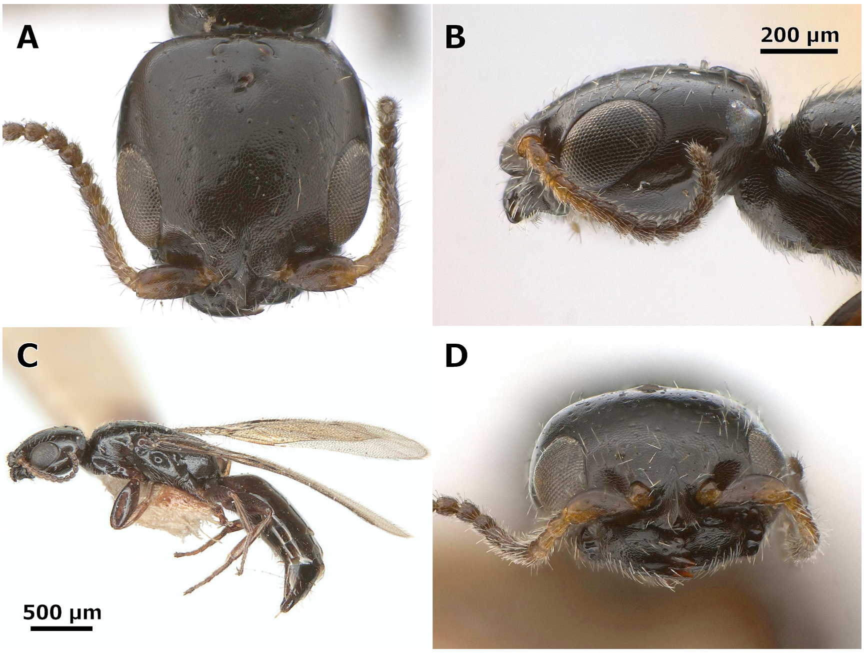


Figure 81. *Sierola osborni*. A: head, dorsal. B: head, lateral. C: lateral habitus. D: head, frontal.

Measurements. LFW 2.41 mm; LM 1.10 mm; WH/LH 0.93; DH/LH 0.63; EV/HE 0.73; EV/WF 0.63; WF/HE 1.16; WH/WF 1.75; OOL/WOT 1.28; DM/LM 0.44; FL/FW 2.07; HFL/HFW 2.31; A3 L/W 1.50; 2R1 L/W 3.03.

Type Material. Holotype ♀. Hawai‘i: Kīpuka Puaulu, 1,140 m [sic], 24 Jun 1966, J.W. Beardsley, BPBMENT 0000018119.

Etymology. From the Hawaiian *‘ōpakapaka*, rough or wrinkled, referring to the unusual sculpture of the metasoma.

Distribution. Known only from the holotype, collected near Kīlauea in 1966.

Discussion. The elevation on the holotype label is incorrect – no part of Kīpuka Puaulu is under 1,190 m.

Sierola osborni Fullaway, 1920

Figure 81, Map 16

Sierola osborni Fullaway, 1920: 91.

Island. Hawai‘i.

Diagnosis. Belonging to the species group with broad, more or less parallel-sided mandible and a sharp clypeal carina. Close to *S. carinata* Fullaway in having the clypeus strongly rounded and recurved apically in profile, separated by having the head broader and usually shorter behind the eyes (WH 0.91–0.94, EV/HE 0.85–0.98), and basal wing cells less densely setose. Very similar to *S. bridwelli* Fullaway of O‘ahu, which has the head broader and ocellar triangle more acute like *S. osborni* but OOL/WOT well in the range of *S. carinata*. The metasoma is almost always faintly microreticulate all over in *S. osborni*, but shining in *S. bridwelli*.

Description. **Female**. *Head*. Clypeal process semicircular, apex broadly rounded; dorsally with a sharp carina; in profile weakly sloping dorsally but strongly rounded and recurved at apex. Mandible broad, not narrowed from base, ventral margin nearly straight; not twisted, at most weakly convex outwardly, outwardly coriaceous, somewhat dull; in ventral view obtusely elbowed. Apex of mandible slightly oblique, with teeth distinctly stronger ventrally. Malar space very small. Dorsal setae of head about as long as flagellar width or scarcely longer. Frons with distinct, uneven punctures, 1–3 pit widths apart. Vertex and gena setae similar to and only slightly longer than setae of frons. Frons microsculpture evident but smooth, shining. Vertex in dorsal view more or less straight; occipital margin broadly rounded. Lateral ocelli separated from vertex crest by about their own length. Ocellar triangle front angle strongly acute. Head broadening posterior to eyes. Dorsum of head in lateral view slightly convex, head deepest on line through posterior margin of eye. Venter of head posterior to mandible convex in lateral view, with relatively sparse setae. Head evenly convex ventrally, genal angle absent. Postgenal depression very shallow, nearly absent. Antenna extending to anterior margin of pronotum.

Mesosoma. Anterior margin of dorsal pronotal area in lateral view evenly rounded. Pronotal setae longer than flagellar width. Propodeal disc laterally shining, with weak microsculpture; metapleural carinae present posteriorly, fading anteriorly. Fore femur only moderately expanded, more than twice as long as wide, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with smooth but distinct microreticulation over all terga (sometimes very faint, rarely absent). Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Body entirely dark brown to black. Antenna entirely dark brown to black. Mandible black. Legs all dark brown to black.

Wings. Membrane tinged with yellow. Basal cells of fore wing with intermediate setation, each with two complete rows and a few additional setae, or sparsely setose, with one or two rows of setae in each cell.

Measurements. LFW 2.52 mm; LM 1.19 mm; WH/LH 0.92 (0.91–0.94); DH/LH 0.59 (0.57–0.59); EV/HE 0.85 (0.85–0.98); EV/WF 0.59 (0.57–0.69); WF/HE 1.45 (1.40–1.51); WH/WF 1.57 (1.56–1.60); OOL/WOT 1.78 (1.59–1.88); DM/LM 0.38; FL/FW 2.31 (2.31–2.47); HFL/HFW 2.62 (2.50–2.80); A3 L/W 1.06 (1.06–1.23). N = 6.

Type Material. Holotype ♀. Hawai‘i: Kīlauea, 12 May 1913, D.T. Fullaway, BPBMENT 0000000038.

Material examined: 1♀, Kīlauea, Jul 1906, R.C.L. Perkins, BPBM. 1♀, Nauhi Gulch, 5,000–6,000 ft [1,520–1,830 m], *Coprosma*, 29 Sep 1931, O.H. Swezey & F.X. Williams, BPBM. 1♀, Kīlauea Iki Rim Trail, 3,800 ft [1,160 m], 23 Jun 1966, J.W. Beardsley, BPBM. 1♀, Kīlauea Forest Reserve IBP study site, 1,586 m, Malaise Trap #2, WAS #71–101, 28 Jun–5 Jul 1971, [no collector], BPBM. 1♀, Hawaii Volcanoes National Park, Thurston, 1175 m, fogging *Metros. polymorpha*, GRU scratch, 23 Oct 1996, D.S. Gruner & D.A. Polhemus, BPBM. 1♀, Kīpuka ‘Āinahou, Pu‘u ‘Ō‘ō Trail, Upper Waiākea Forest, 26 Oct 1996, M.J. & C.A. Tauber, BPBM. 1♀, So. Hilo Dist., Kīpuka nr. Mawae (Kīpuka #14), Saddle Rd, 5,000 ft [1,520 m], 11 May 1997, M.J. & C.A. Tauber, BPBM. 1♀, Laupāhoehoe Forest Reserve, Blair Rd, 1,200 m, fogging *Metros. polymorpha*, GRU scratch, 3–5 Jun 1997, D.S. Gruner & D.A. Polhemus, BPBM. 4♀, Laupāhoehoe Forest Reserve, 1,219 m, fogging *Metros. polymorpha*, 4 Jun 1997, D.S. Gruner (specimens: A3A-5, GRU 4262–002; A5–1, GRU 4290–002; A3A-6, GRU 4272–001; A2A-1, GRU 4224–001), BPBM. 1♀, Laupāhoehoe Forest Reserve, 1,219 m, fogging *Metros. polymorpha*, B2–5, GRU 5133–002, 6 Jun 1997, D.S. Gruner, BPBM. 1♀, Hawaii Volcanoes National Park, 1,200 m, fogging *Metros. polymorpha*, 7–4, GRU 1085–004, 7 Oct 1997, D.S. Gruner & D.A. Polhemus, BPBM. 1♀, Kohala Forest Reserve, 1,158 m, fogging *Metros. polymorpha*, 5–1, GRU 0589–009, 12 Oct 1997, D.S. Gruner & D.A. Polhemus, BPBM. 2♀, Laupāhoehoe Forest Reserve, 1,219 m, fogging *Metros. polymorpha*, 6 Nov 1997, D.S. Gruner (specimens: B2–5, GRU 5133–003; B2–6, GRU 5065–002), BPBM. 1♀, Volcano Dump, yellow sticky card, site #1, card A, 27 Jun 2003, BPBM. 1♀, Upper Waiākea FR, kīpuka 31, 1,767 m, 19.6334°N 155.3694°W, canopy Malaise trap, collection K31-C-M1, lot HI-0582, 8 Apr 2009, D. Leopold, UMD. 2♀, Upper Waiākea FR, kīpuka 9, 1,710 m, 19.6678°N 155.3693°W, canopy Malaise trap, collection K9-C-M, lot HI-1417, 20 Jul 2009, J. Riley & E. Parissenti, UMD. 1♀, Upper Waiākea FR, kīpuka 9, 1,710 m, 19.6678°N 155.3693°W, canopy Malaise trap, collection K9-C-M, lot HI-1428, 20 Jul 2009, J. Riley & E. Paris-

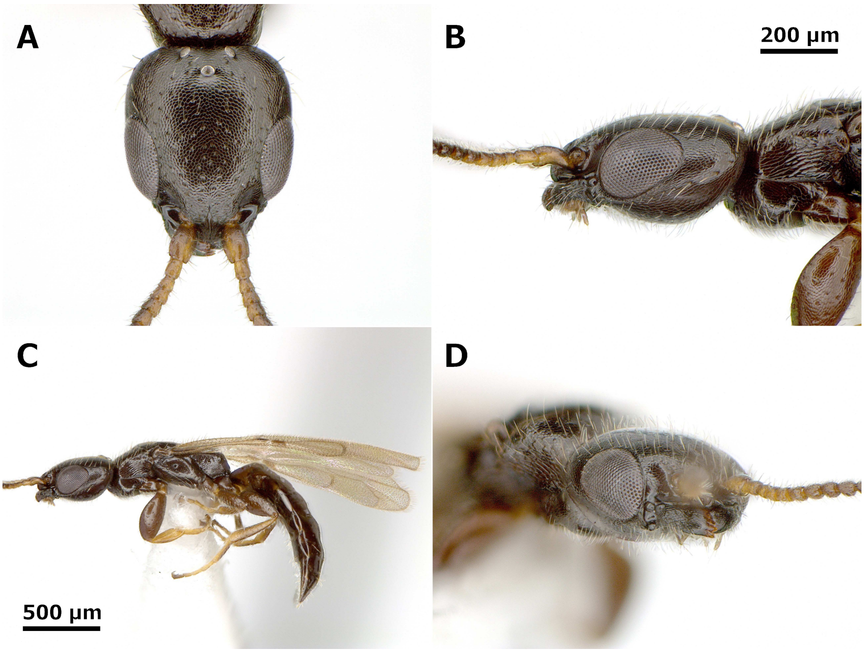


Figure 82. *Sierola pakua*. A: head, dorsal. B: head, lateral. C: lateral habitus. D: head, frontal.

senti, UMD. 1♀, Upper Waiākea FR, kīpuka 26, 1,742 m, 19.6404°N 155.3610°W, canopy Malaise trap, collection K26-E-M, lot HI-1811, 10 Aug 2009, J. Riley & E. Parissenti, UMD. 1♀, Upper Waiākea FR, kīpuka 25, 1,721 m, 19.6489°N 155.3625°W, canopy Malaise trap, collection K25-E-M, lot HI-1687, 9 Sep 2009, D. Leopold, UMD. 2♀, Kīpāhoehoe mid kīpuka, 1,410 m, 19.2480°N 155.8166°W, Townes Malaise trap, H22062701–02, 11 May–27 Jun 2022, K.N. Magnacca, BPBM.

Distribution. Uncommon but widely distributed across the windward side of the island in wet forest; not known from Kona or Ka‘ū.

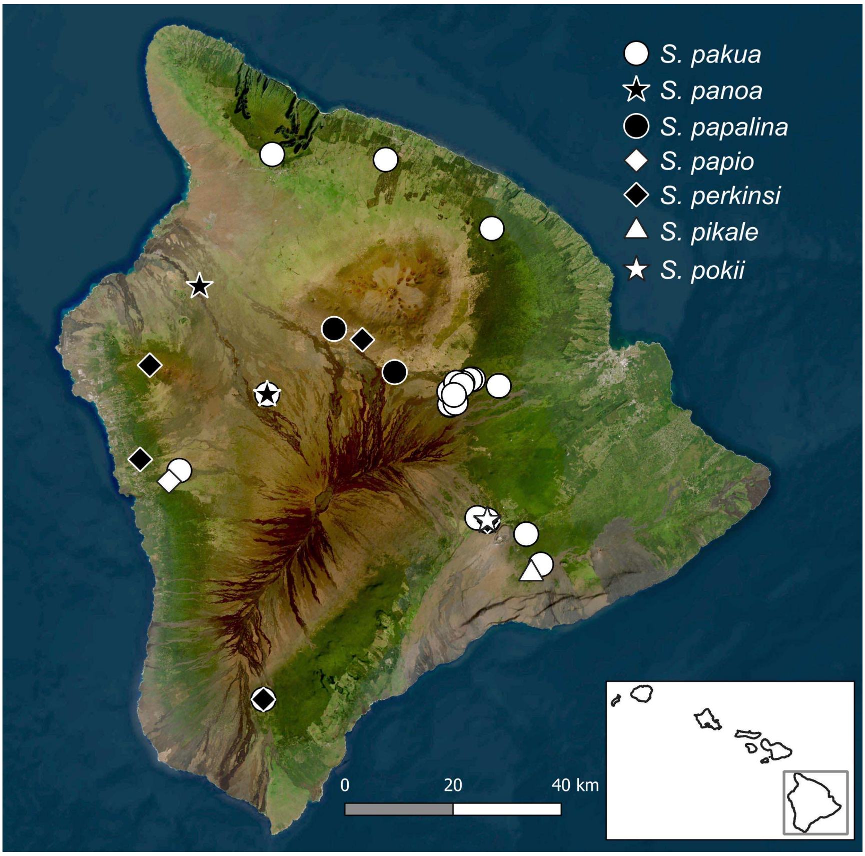
Discussion. This species seems to be unusually variable in the microsculpture of the metasoma. it is distinct in the holotype and some other specimens, but very faint in others and completely polished in one. Also see comments under *S. carinata*.

Sierola pakua n. sp.

Figure 82, Map 17

Island. Hawai‘i.

Diagnosis. Belonging to the group of species with a sharp, evenly curved clypeal carina and dense setation of the basal wing cells. Easily distinguished from similar species by the moderately narrow mandible which is distinctly concave ventrally. In addition, the lateral ocelli are nearly touching the vertex crest, frons microsculpture is coriaceous, and the head moderately deep and broad (WH/LH 0.82–0.87, DH/LH 0.54–0.57). Very similar to *S. larifuga*, separated by lacking the line of distinct tesselate microsculpture behind the eye, frons microsculpture coriaceous rather than strongly granular, and apparently always having the femora all dark; also the ocellar triangle is usually smaller and the fore femur narrower (OOL/WOT 1.20–1.47 and FL/FW 2.04–2.33, compared to 1.10–1.23 and 1.73–2.00 respectively in *S. larifuga*).



Map 17. Collection localities of *Sierola pakua, S. panoa, S. papalina, S. papio, S. perkinsi, S. pikale,* and *S. pokii*.

Description. **Female**. *Head*. Clypeal process semi-elliptical, apex broadly rounded; dorsally with a sharp carina; in profile evenly curved from base to apex, apical angle slightly acute, or weakly sloping dorsally but strongly rounded and recurved at apex. Mandible moderately narrow at base, distinctly broader on apical half, ventral margin distinctly concave; not twisted, at most weakly convex outwardly, outwardly coriaceous, somewhat dull; in ventral view evenly, moderately curved. Apex of mandible vertical, with equally strong teeth. Malar space very small. Dorsal setae of head about as long as flagellar width or scarcely longer. Frons with distinct, uneven punctures, 1–3 pit widths apart. Vertex and gena setae distinctly longer than frons setae but only about as thick, not particularly conspicuous. Frons microsculpture coriaceous, matte but without strong surface texture. Vertex in dorsal view more or less straight; occipital margin narrowly rounded. Lateral ocelli nearly touching vertex crest. Ocellar triangle front angle right. Head more or less parallel-sided for some distance posterior to eyes. Dorsum of head in lateral view slightly convex, head deepest on line through posterior margin of eye. Venter of head posterior to mandible convex in lateral view, with relatively sparse setae. Head evenly convex ventrally, genal angle absent. Gena ventral to eye flat. Postgenal depression very shallow, nearly absent. Antenna extending to posterior margin of pronotum.

Mesosoma. Anterior margin of dorsal pronotal area in lateral view evenly rounded. Pronotal setae longer than flagellar width. Propodeal disc laterally finely, weakly striate;

metapleural carinae present posteriorly, fading anteriorly. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Highly polished, without a trace of microsculpture. Sixth sternum broadly glabrous medially, with sparse setae laterally.

Color. Body entirely dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible black. Coxae, trochanters, and femora dark brown, all tibiae and tarsi yellow-brown.

Wings. Membrane weakly infuscate. Basal cells of fore wing densely and conspicuously setose.

Measurements. LFW 1.73 mm; LM 0.80 mm; WH/LH 0.85 (0.82–0.87); DH/LH 0.55 (0.54–0.57); EV/HE 0.76 (0.67–0.86); EV/WF 0.67 (0.60–0.76); WF/HE 1.14 (1.03–1.23); WH/WF 1.69 (1.63–1.78); OOL/WOT 1.25 (1.20–1.47); DM/LM 0.35; FL/FW 2.15 (2.04–2.33); HFL/HFW 2.37 (2.00–2.37); A3 L/W 1.00 (0.74–1.00); 2R1 L/W 3.07. N = 10.

Type Material. Holotype ♀. Hawai‘i: Upper Waiākea Forest Reserve, 1,280 m, clipping *Metros. polymorpha*, 25-D, GRU 7584–001, 3 May 2001, D.S. Gruner, BPBMENT 0000018120. Paratypes: 1♀, Kīlauea, 4,000 ft [1,220 m], dry forest, 6 Jul 1918, W.M. Giffard, BPBM. 1♀, Kaiwiki, 22 Sep 1918, O.H. Swezey, BPBM. 1♀, Kona, 27 Jul 1921, O.H. Swezey & F.X. Williams, BPBM. 1♀, Honoka‘a, 2,500 ft [m], 25 May 1922, F.X. Williams, BPBM. 1♀, Kīpuka Puaulu, *Zanthoxylum*, 12 Oct 1929, R.R. Whitten, BPBM. 1♀, ‘Ālo‘i Crater, nr. Chain of Craters Rd, 3,000 ft [900 m], 23 Jun 1966, J.W. Beardsley, BPBM. 2♀, Pu‘u Hualālai, 900–1,200 m, 27–28 Jun 1966, J.W. Beardsley, BPBM. 1♀, Mauna Loa Strip Road, 4,300 ft [1,300 m], D-Vac sample ex *Acacia koa*, 19 Jul 1971, J. Leeper, BPBM. 1♀, Laupāhoehoe Forest Reserve, 1,219 m, fogging *Metros. polymorpha*, A6–2, GRU 4344–002, 5 Jun 1997, D.S. Gruner, BPBM. 2♀, Hawaii Volcanoes National Park, 1,200 m, fogging *Metros. polymorpha*, 7 Oct 1997, D.S. Gruner & D.A. Polhemus (specimens: 6–1, GRU 1136–009; 8–4, GRU 1016–003), BPBM. 1♀, Kohala Forest Reserve, 1,158 m, fogging *Metros. polymorpha*, 2–1, GRU 0463–003, 12 Oct 1997, D.S. Gruner & D.A. Polhemus, BPBM. 1♀, Pōhakuloa Training Area, Kīpuka ‘Alalā pan trap, OUA2 CBY, 11 May 2000, P. Oboyski *et al.*, USNM. 1♀, Upper Waiākea Forest Reserve, 1,280 m, clipping *Metros. polymorpha*, 16-B, GRU 7415–001, 17 Apr 2001, D.S. Gruner, BPBM. 1♀, Kahuku Ranch, yellow sticky card, site #5K-9, card MM, 23 Feb 2007, BPBM. 1♀, Upper Waiākea FR, kīpuka 38, 1,731 m, 19.6363°N 155.3609°W, canopy Malaise trap, collection K38-C-M1, lot HI-0646, 9 Apr 2009, D. Leopold, USNM.

Additional (non-type) material: 21♀, Upper Waiākea FR, various kīpuka, 1,495–1,789 m, ‘ōhi‘a canopy branch clipping, 7 Jul 2009–13 May 2013, D. Leopold, B. Hwang, E.E. Wilson, P. LoCicero & C. Morrison, UMD.

Etymology. From the Hawaiian *pākūā*, commonplace or ordinary, referring to the similarity to other species and lack of particularly distinguishing characters.

Distribution. Widespread and uncommon, mainly in mesic forest but sometimes in wet forest.

Discussion. With experience this species is relatively easily distinguished by the ventrally concave mandible, but more objective characters will be more reliable.

***Sierola panoa* n. sp.**

Figure 83, Map 17

Island. Hawai‘i.

Diagnosis. Easily distinguished among species with a sharp clypeal carina by the heterogeneous sculpture of the frons (dull between the eyes, smoother and somewhat shining above) which obscures the punctation. The mandible is twisted and the basal wing cells sparsely setose. Very similar in general appearance to *S. curvignatha*, but the clypeal carina is sharp and basal wing cells sparsely setose.

Description. Female. *Head*. Clypeal process semicircular, apex broadly rounded; dorsally with a sharp carina, or weakly carinate; in profile evenly curved from base to apex, apical angle slightly acute. Mandible narrow, expanded at base and apex, ventral margin distinctly concave; slightly twisted, outwardly polished and shining distal of bend, coria-

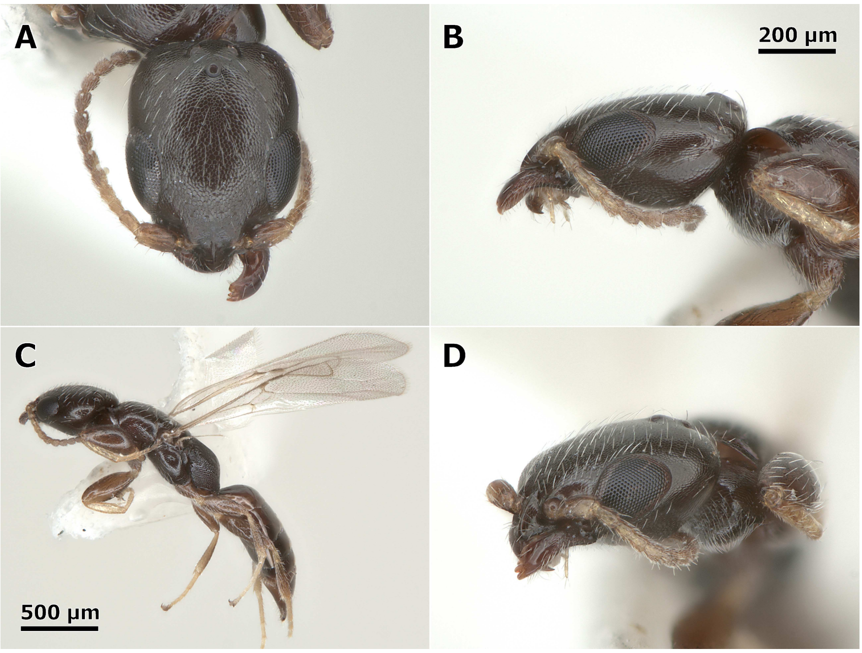


Figure 83. *Sierola panoa*. A: head, dorsal. B: head, lateral. C: lateral habitus. D: head, frontal.

ceous and dull basally; in ventral view evenly, moderately curved. Apex of mandible vertical, with teeth distinctly stronger ventrally. Malar space 1/4 as long as width of base of mandible. Dorsal setae of head distinctly longer than flagellar width. Frons punctation obscured by microsculpture. Vertex and gena setae similar to and only slightly longer than setae of frons. Frons microsculpture microreticulate and dull between eyes and antennae, distinctly smoother between eyes and ocelli. Vertex in dorsal view more or less straight; occipital margin narrowly rounded. Lateral ocelli distinctly separate from vertex crest by less than ocellus length. Ocellar triangle front angle weakly acute. Head more or less parallel-sided for some distance posterior to eyes. Head deepest on line through just posterior of eye. Venter of head posterior to mandible flat in lateral view, with moderately dense pubescence. Genal angle broadly rounded. Gena ventral to eye flat. Postgenal depression shallow, rounded. Antenna extending to pronotum.

Mesosoma. Anterior margin of dorsal pronotal area in lateral view evenly rounded. Pronotal setae longer than flagellar width. Propodeal disc laterally coarsely rugulose; transverse carina absent, brow of declivity broadly rounded; metapleural carinae complete. Fore femur only moderately expanded, more than twice as long as wide, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Highly polished, without a trace of microsculpture. Sixth sternum broadly glabrous medially, with sparse setae laterally.

Color. Body entirely dark brown to black. Antenna with scape and apex brown, middle flagellar segments brown dorsally and orange ventrally. Mandible black to reddish brown. Coxae and femora dark brown to black, fore tibia and tarsi yellow, mid and hind tibiae brown with yellow bands at bases and apices.

Wings. Membrane hyaline. Basal cells of fore wing sparsely setose, with one or two rows of setae in each cell. Cell 1M weakly convex posteriorly, corner posteroapical.

Measurements. LFW 1.77 mm; LM 0.92 mm; WH/LH 0.75 (0.73–0.78); DH/LH 0.51 (0.50–0.53); EV/HE 0.97 (0.91–1.02); EV/WF 0.87 (0.81–0.93); WF/HE 1.12 (1.08–1.16);

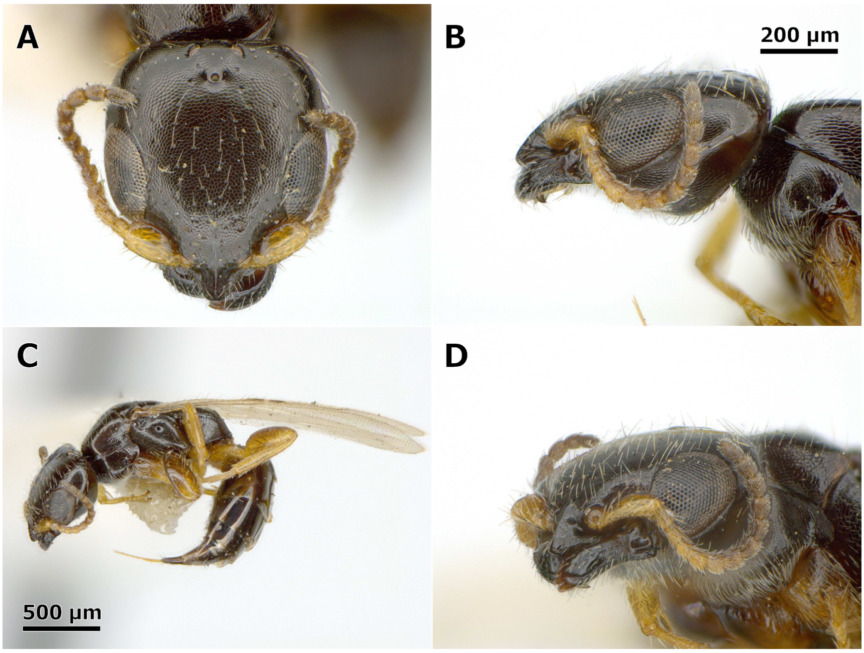


Figure 84. *Sierola papalina*. A: head, dorsal. B: head, lateral. C: lateral habitus. D: head, frontal.

WH/WF 1.74 (1.69–1.75); OOL/WOT 1.60 (1.46–1.69); DM/LM 0.37; FL/FW 2.29 (2.23–2.38); HFL/HFW 2.75 (2.62–2.92); A3 L/W 1.40 (1.29–1.57); 2R1 L/W 2.88. N = 10.

Type Material. Holotype ♀. Hawai‘i: Mile post 18 along Hawai‘i Belt Rd nr. Pu‘u Anahulu, 2,150 ft [660 m], yellow sticky board trap, 20 Oct–3 Nov 1995, W.D. Perreira, BPBMENT 0000018121. Paratypes: 1♀, same data as holotype, BPBM. Pōhakuloa Training Area, Kīpuka ‘Alalā pan trap, P. Oboyski *et al.*: 1♀, OUYB Chal 05 JEH, 9 Mar 2000; 1♀, NUA2 CBW, 11 May 2000; 1♀, OUA3 CBY, 12 Oct 2000; 1♀, OUA1 CBG, 9 Feb 2001; 2♀, OUA3 CBY, 9 Feb 2001, all BPBM. 1♀, Pōhakuloa Training Area, Kīpuka ‘Alalā Malaise, OUA3, 19 May 2000, P. Oboyski *et al.*, USNM.

Etymology. From the Hawaiian *panoa*, dry or arid, referring to the distribution of this species on the dry leeward side.

Distribution. Known from two series, from lowland North Kona and Pōhakuloa.

Sierola papalina n. sp.

Figure 84, Map 17

Island. Hawai‘i.

Diagnosis. Very distinctive among the Hawai‘i species: clypeus elongate trapezoidal, dorsally with a sharp carina, and basal wing cells nearly glabrous. Similar to *S. winiwini* n. sp. in general appearance, including the prominent clypeus, but the head is deeper and wider, mandible broader, and the clypeus is thicker in profile with a distinct carina.

Description. **Female**. *Head*. Clypeal process elongate trapezoidal, apex broadly rounded to truncate; dorsally with a sharp carina; in profile evenly sloping, nearly straight (narrowly recurved at apex). Mandible moderately narrow, slightly narrowed medially from base, ventral margin weakly concave; slightly twisted, outwardly polished and shining distal of bend, coriaceous and dull basally; in ventral view obtusely elbowed. Apex of mandible vertical, with teeth distinctly stronger ventrally. Malar space very small. Dorsal setae of head distinctly longer than flagellar width. Frons with distinct, uneven punctures, 1–3 pit widths apart. Vertex and gena setae similar to and only slightly longer than setae of frons.

Frons microsculpture finely microreticulate, surface weakly matte. Vertex in dorsal view more or less straight; occipital margin broadly rounded. Lateral ocelli distinctly separate from vertex crest by less than ocellus length. Ocellar triangle front angle weakly to strongly acute. Head more or less parallel-sided for some distance posterior to eyes. Dorsum of head in lateral view slightly convex, head deepest on line through posterior margin of eye. Venter of head posterior to mandible flat in lateral view, with moderately dense pubescence. Head strongly convex ventrally, genal angle absent. Postgenal depression shallow, rounded. Antenna extending to pronotum.

Mesosoma. Pronotal setae longer than flagellar width. Propodeal disc laterally finely, weakly striate; median carina faintly present; transverse carina faintly present; metapleural carinae complete. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with faint microsculpture laterally. Sixth sternum narrowly glabrous medially, with moderately dense setae laterally, becoming longer laterad.

Color. Body entirely dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible black. Coxae and basal 2/3 of femora brownish, legs otherwise yellow.

Wings. Membrane hyaline. Basal cells of fore wing nearly glabrous, with only few scattered setae.

Measurements. LFW 1.95 mm; LM 1.01 mm; WH/LH 0.85; DH/LH 0.55; EV/HE 0.74; EV/WF 0.60; WF/HE 1.24; WH/WF 1.70; OOL/WOT 1.70; DM/LM 0.39; FL/FW 1.91; HFL/HFW 2.29; A3 L/W 1.17; 2R1 L/W 3.06.

Type Material. Holotype ♀. Hawai‘i: Pōhakuloa, 1,800 m, 25 Jun 1966, J.W. Beardsley, BPBMENT 0000018122.

Paratypes: 1♀, Humu‘ula, *Myoporum*, 31 Jul 1935, R.L. Usinger, BPBM. 1♀, Pōhakuloa, on *Chenopodium*, 17 Jun 1966, J.W. Beardsley, BPBM. 1♀, Pōhakuloa, 1,800 m, 21 Jun 1966, J.W. Beardsley, BPBM.

Etymology. From the Hawaiian *papālina*, cheek, referring to the strongly convex gena.

Distribution. Restricted to the Pōhakuloa–Humu‘ula region in dry to dry-mesic forest. Known from only four specimens, last collected in 1966.

***Sierola papio* n. sp.**

Figure 85, Map 17

Island. Hawai‘i.

Diagnosis. Part of a small complex of species with the clypeus flat dorsally and evenly sloping in profile. Overall most similar to *S. angustata* Fullaway, separated by the black mandible with a large ventral tooth. The latter character is shared with *S. graciloides* n. sp., which differs in having the head broader and deeper, basal wing cells more densely setose, and legs all yellow. Easily distinguished from both by having the head flat dorsally in lateral view.

Description. **Female**. *Head*. Clypeal process rounded triangular, apex rounded; dorsally flat, not carinate, slightly convex only laterally; in profile evenly sloping, nearly straight. Mandible moderately narrow at base, distinctly broader on apical half, ventral margin distinctly concave; strongly twisted, outwardly coriaceous, somewhat dull; in ventral view strongly elbowed. Apex of mandible strongly oblique, with teeth distinctly stronger ventrally. Malar space 1/4 as long as width of base of mandible. Dorsal setae of head about as long as flagellar width or scarcely longer. Frons with shallow, uneven punctures, 1–3 pit widths apart. Vertex and gena setae distinctly longer than frons setae but only about as thick, not particularly conspicuous. Frons microsculpture finely microreticulate, surface weakly matte. Vertex in dorsal view very slightly concave; occipital margin not carinate but forming a pronounced ridge. Lateral ocelli nearly touching vertex crest. Ocellar triangle front angle weakly obtuse. Head more or less parallel-sided for some distance posterior to eyes. Dorsum of head in lateral view nearly flat, head deepest on line through posterior margin of eye. Venter of head posterior to mandible convex

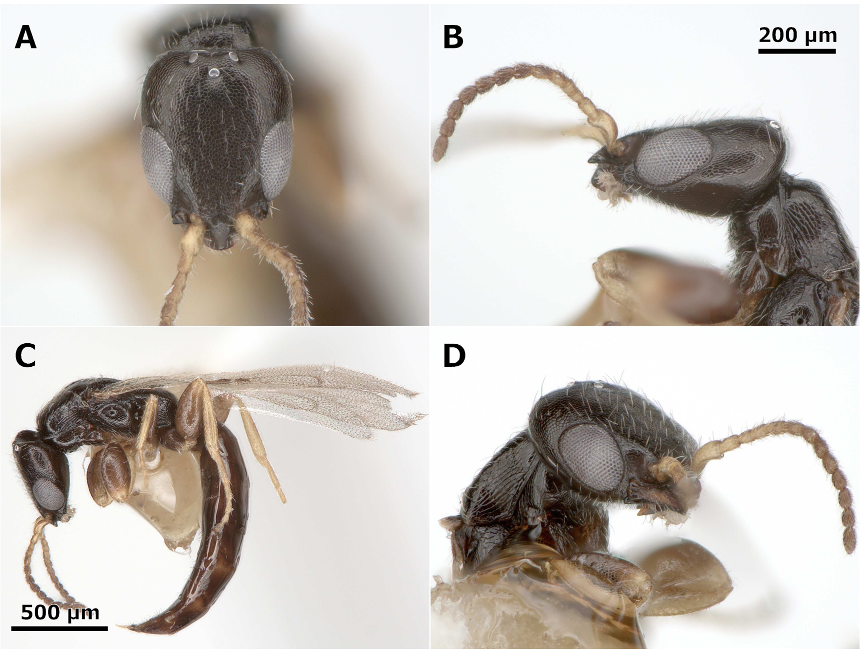


Figure 85. *Sierola papio*. A: head, dorsal. B: head, lateral. C: lateral habitus. D: head, frontal.

in lateral view, with relatively sparse setae. Head evenly convex ventrally, genal angle absent. Side of head posterior to eye with a line of smooth tesselate microsculpture extending from posteroventral margin of eye to vertex crest, distinctly different from smoother sculpting dorsally and ventrally. Postgenal depression very shallow, nearly absent. Antenna extending to posterior margin of pronotum.

Mesosoma. Anterior margin of dorsal pronotal area in lateral view weakly angulate, pronotal disc distinctly flattened. Pronotal setae longer than flagellar width. Propodeal disc laterally finely, weakly striate; metapleural carinae present posteriorly, fading anteriorly. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with faint microsculpture laterally. Sixth sternum narrowly glabrous medially, laterally with dense pilose setae.

Color. Body entirely dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible mostly black, orange-brown medially. Coxae and femora brown, tibiae, tarsi, and trochanters yellow.

Wings. Membrane hyaline. Basal cells of fore wing with intermediate setation, each with two complete rows and a few additional setae. Cell 1M distinctly convex posteriorly, corner medioapical.

Measurements. LFW 1.79 mm; LM 0.85 mm; WH/LH 0.76; DH/LH 0.49; EV/HE 0.84; EV/WF 0.86; WF/HE 0.98; WH/WF 1.85; OOL/WOT 1.30; DM/LM 0.37; FL/FW 1.92; HFL/HFW 2.29; A3 L/W 1.20; 2R1 L/W 2.89.

Type Material. Holotype ♀. Hawai'i: Kealakekua Ranch, 3,400 ft [1,040 m], beating *Pisonia brunoniana*, 16 Mar 2012, K.N. Magnacca, BPBMENT 0000018123.

Etymology. From the Hawaiian *pāpio*, pressed down or flattened, referring to the resemblance of this species to *S. angustata* with the head and pronotum flattened.

Distribution. Known only from the holotype, collected in wet-mesic forest in Kona.

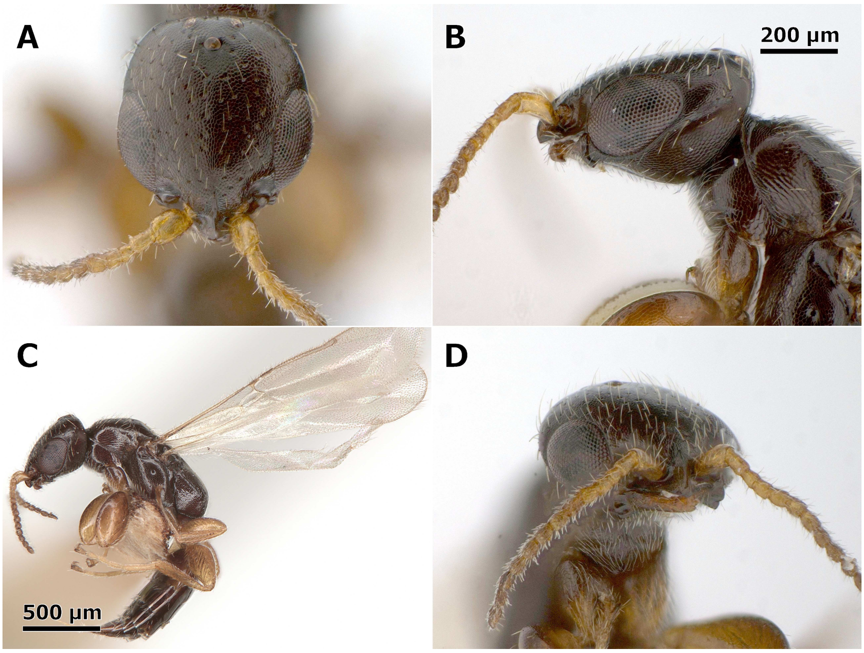


Figure 86. *Sierola perkinsi*. A: head, dorsal. B: head, lateral. C: lateral habitus. D: head, frontal.

Sierola perkinsi Fullaway, 1920

Figure 86, Map 17

Sierola perkinsi Fullaway, 1920: 151.

Island. Hawai‘i.

Diagnosis. Belonging to the large group of species with the basal wing cells densely setose, clypeus carinate and evenly curved, mandible narrow and parallel-sided to slightly concave ventrally, and lateral ocelli nearly touching the vertex crest. Separated from other species on Hawai‘i by the relatively smooth microsculpture of the frons, and usually broad fore femur (FL/FW 1.79–1.97). The head and femur dimensions narrowly overlap with *S. pakua* n. sp. (which may also have somewhat shining microsculpture) but the mandible is not strongly concave ventrally as in that species. Also similar to the introduced *S. larifuga*, which has the frons distinctly dull and a line of tesselate microsculpture laterally between the eye and vertex. Nearly identical to *S. anemophila* Fullaway of O‘ahu, distinguished only by having the antenna slightly shorter, A3 about as long as wide (L/W 0.9–1.1; slightly but distinctly longer than wide in *S. anemophila*, L/W ~1.2).

Description. **Female**. *Head*. Clypeal process semicircular, apex broadly rounded; dorsally with a sharp carina; in profile evenly curved from base to apex, apical angle slightly acute. Mandible narrow, more or less parallel-sided except at base; not twisted, at most weakly convex outwardly, outwardly coriaceous, somewhat dull; in ventral view evenly, moderately curved. Apex of mandible vertical, with equally strong teeth. Malar space almost absent. Dorsal setae of head about as long as flagellar width or scarcely longer. Frons with distinct, uneven punctures, 1–3 pit widths apart. Vertex and gena setae distinctly longer than frons setae but only about as thick, not particularly conspicuous. Frons microsculpture finely microreticulate, surface weakly matte. Vertex in dorsal view more or less straight; occipital margin broadly rounded. Lateral ocelli nearly touching vertex crest. Ocellar triangle front angle weakly acute to right. Head narrowed posterior to eyes. Dorsum of head in lateral view slightly convex, head deepest on line through eye. Venter of head posterior to mandible convex in lateral view, with relatively sparse setae. Head strongly convex ventrally, genal angle absent. Postgenal depression very shallow, nearly absent. Antenna extending to pronotum.

Mesosoma. Anterior margin of dorsal pronotal area in lateral view evenly rounded. Pronotal setae longer than flagellar width. Propodeal disc laterally coarsely striate; metapleural carinae present posteriorly, fading anteriorly. Fore femur strongly expanded, less than twice as long as wide, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Highly polished, without a trace of microsculpture. Sixth sternum narrowly glabrous medially, laterally with dense pilose setae.

Color. Body entirely dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible black. Coxae and femora brown, tibiae, tarsi, and trochanters brownish orange.

Wings. Membrane tinged with yellow. Basal cells of fore wing densely and conspicuously setose.

Measurements. LFW 2.03 mm; LM 1.01 mm; WH/LH 0.87 (0.86–0.92); DH/LH 0.57 (0.57–0.60); EV/HE 0.64 (0.60–0.64); EV/WF 0.58 (0.53-.058); WF/HE 1.09 (1.04–1.19); WH/WF 1.71 (1.64–1.79); OOL/WOT 1.23 (1.17–1.37); DM/LM 0.39; FL/FW 1.79 (1.79–1.97); HFL/HFW 2.15 (2.15–2.43); A3 L/W 1.00 (0.94–1.13). N = 5.

Type Material. Holotype ♀. Hawai‘i: Kīlauea, 4,000 ft [1,220 m], dry forest, 11 Jan 1917, W.M. Giffard & F. Muir, BPBMENT 0000000157.

Material examined: 1♀, Kīlauea, 686, Aug 1896, R.C.L. Perkins, USNM. 1♀, Kīlauea, 4,000 ft [1,220 m], 21.7 [date?], R.C.L. Perkins, USNM. 1♀, Hualālai, 6,300 ft [1,920 m], 1 Aug 1929, F.X. Williams, BPBM. 2♀, near Humu‘ula, *Sophora*, 7 Aug 1946, E.C. Zimmerman, BPBM. 1♀, Kahuku Ranch, yellow sticky card, site #5K-9, card MM, 23 Feb 2007, BPBM.

Distribution. Rare but widespread in dry forest. Known from seven specimens, but recently collected.

Discussion. The collection date of the holotype was incorrectly written by Fullaway as 1 Nov (apparently read as 11.1.17 rather than 11.I.17 as Giffard always wrote); the date of the *S. notabilis* paratype taken with it was recorded correctly.

***Sierola pikale* n. sp.**

Figure 87, Map 17

Island. Hawai‘i.

Diagnosis. A distinctive species: the combination of head flat dorsally, clypeus with a sharp dorsal carina, and mandible moderately broad and distinctly concave ventrally separates it from all on Hawai‘i except *S. kikanu* n. sp., from which it is immediately distinguished by the sparsely setose basal wing cells. The mandible is also strongly convex outwardly almost from the base, which makes it easily recognizable. Most similar to *S. koa* Fullaway of O‘ahu, which has the mandible more sharply constricted at the base.

Description. **Female**. *Head*. Clypeal process semicircular, apex rounded; dorsally with a sharp carina; in profile weakly sloping dorsally but strongly rounded and recurved at apex. Mandible moderately broad, distinctly narrowed medially and expanded at apex, ventral margin concave (slightly narrowed apically); apical half of mandible strongly convex outwardly, teeth arrayed on frontal and dorsal surfaces, outwardly coriaceous, somewhat dull; in ventral view strongly elbowed. Apex of mandible vertical, with teeth distinctly stronger ventrally. Malar space almost absent. Dorsal setae of head about as long as flagellar width or scarcely longer. Frons moderately punctate, about 2–3 pit widths apart. Vertex and gena setae similar to and only slightly longer than setae of frons. Frons microsculpture coriaceous, matte but without strong surface texture. Vertex in dorsal view more or less straight; occipital margin broadly rounded. Lateral ocelli distinctly separate from vertex crest by less than ocellus length. Ocellar triangle front angle strongly acute. Head more or less parallel-sided for some distance posterior to eyes. Dorsum of head in lateral view slightly convex or nearly flat posterior to middle of eyes, head deepest on line through posterior margin of eye. Venter of head posterior to mandible convex in lateral view, with relatively sparse setae. Head weakly convex ventrally, genal angle absent. Postgenal depression shallow, rounded. Antenna extending to anterior margin of pronotum.

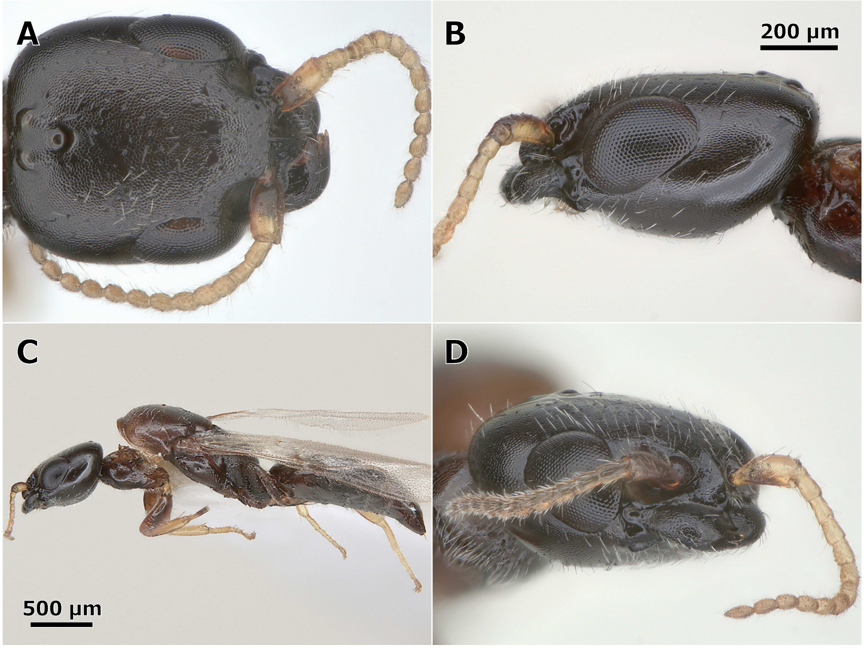


Figure 87. *Sierola pikale*. A: head, dorsal. B: head, lateral. C: lateral habitus. D: head, frontal.

Mesosoma. Anterior margin of dorsal pronotal area in lateral view evenly rounded. Pronotal setae about as long as flagellar width or scarcely longer. Propodeal disc laterally finely, weakly striate; metapleural carinae present posteriorly, fading anteriorly. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with faint microsculpture laterally. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Body entirely dark brown to black. Antenna yellow-brown. Mandible black. Coxae and femora dark brown to black, tibiae, tarsi, and trochanters yellow.

Wings. Membrane hyaline. Basal cells of fore wing sparsely setose, with one or two rows of setae in each cell. Cell 1M weakly convex posteriorly, corner posteroapical.

Measurements. LFW 2.69 mm; LM 1.34 mm; WH/LH 0.82 (0.80–0.83); DH/LH 0.55; EV/HE 0.97 (0.97–1.01); EV/WF 0.78 (0.78–0.82); WF/HE 1.24 (1.23–1.24); WH/WF 1.62 (1.62–1.66); OOL/WOT 1.94 (1.81–1.94); DM/LM 0.38; FL/FW 2.00 (2.00–2.13); HFL/HFW 2.41 (2.34–2.42); A3 L/W 1.23 (1.23–1.28); 2R1 L/W 2.78. N = 3.

Type Material. Holotype ♀. Hawai‘i: ‘Āinahou Ranch, yellow sticky card, site #3, card C, 21 Jun 2007, BPBMENT 0000018124. Paratypes: 2♀, same data as holotype, BPBM.

Etymology. From the Hawaiian *pīkale*, sticky like the residue on a poi pounding board, referring to the collection of all the known specimens on yellow sticky board traps.

Distribution. Rare, known only from three specimens collected in mid-elevation dry forest on the south flank of Kīlauea.

Discussion. All the specimens were retrieved from old yellow sticky card traps, and are in rather poor condition. However, it is a very distinctive species among the fauna of Hawai‘i island, most closely resembling *S. koa* of O‘ahu.

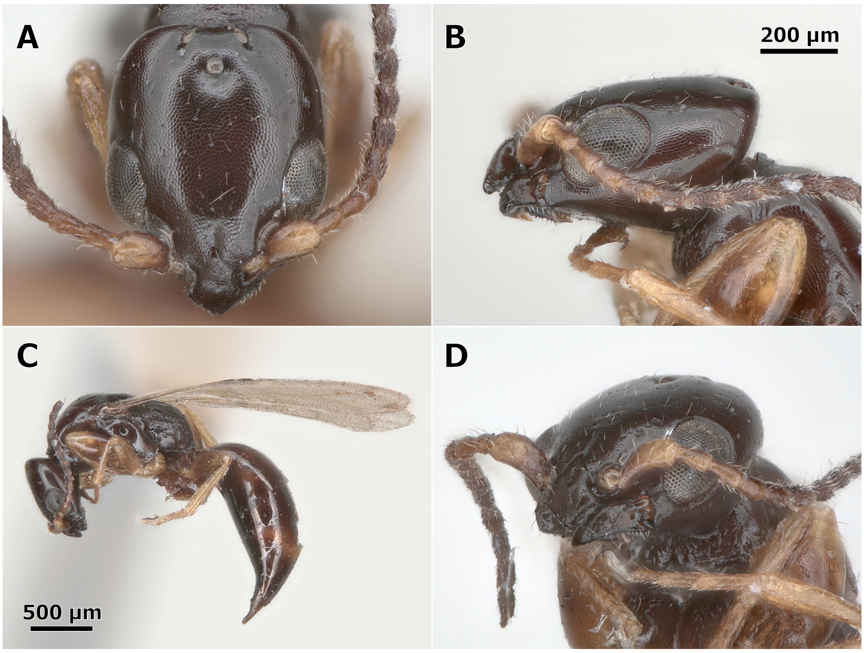


Figure 88. *Sierola pili*. A: head, dorsal. B: head, lateral. C: lateral habitus. D: head, frontal.

***Sierola pili* n. sp.**

Figure 88, Map 18

Island. Hawai‘i.

Diagnosis. Easily recognized by the flat, spatulate, somewhat bulbous clypeus. The head is large, convex above and flat below, vertex distinctly angulate, and mandible with a single large ventral tooth and the other teeth small. Nearly identical to *S. ihupehu*, differing in the shape of the head and curvature of the clypeus: head narrower (WH/LH 0.75–0.78) and less convex dorsally; vertex mostly straight in dorsal view, narrowly and shallowly concave behind the ocelli; clypeus evenly curved with front of head; and apex of clypeus usually narrowly transverse.

Description. **Female**. *Head*. Clypeal process spatulate, expanded beyond anterior margin of head, apex narrowly transverse (rarely broadly truncate); dorsally flat, not carinate, slightly convex only laterally; in profile evenly sloping, nearly straight. Mandible moderately broad, more or less parallel-sided except at base; strongly twisted, outwardly shining but with distinct, fine microsculpture; in ventral view distinctly elbowed externally, internal margin nearly straight. Apex of mandible strongly oblique, with a single large ventral tooth and a few small teeth on inner margin. Malar space 1/3 as long as width of base of mandible. Dorsal setae of head shorter than flagellar width. Frons with sparse, scattered punctures, mostly 3 pit widths apart or more. Vertex and gena setae similar to and only slightly longer than setae of frons. Frons microsculpture evident but smooth, shining. Vertex in dorsal view shallowly emarginate between ocelli, otherwise straight; occipital margin not carinate but forming a pronounced ridge. Lateral ocelli distinctly separate from vertex crest by less than ocellus length. Ocellar triangle front angle strongly acute. Head more or less parallel-sided for some distance posterior to eyes. Dorsum of head in lateral view nearly flat posterior to middle of eyes, head deepest on line well posterior of eye. Venter of head posterior to mandible flat in lateral view, with relatively sparse setae. Genal angle present posteriorly, not prominent, head relatively flat. Gena ventral to eye flat. Postgenal depression deep, distinct, broad. Antenna extending to posterior margin of pronotum.

Mesosoma. Anterior margin of dorsal pronotal area in lateral view evenly rounded. Pronotal setae short, inconspicuous. Metapleural carinae complete. Fore femur strongly expanded, less than twice as long as wide, with both anterior and posterior surfaces convex, not strongly compressed, more or less straight in dorsal view.

Metasoma. Shining, with very faint microreticulation over posterior terga. Sixth sternum narrowly glabrous medially, laterally with dense pilose setae.

Color. Body entirely dark brown to black. Antenna entirely dark brown to black. Mandible black. Coxae and basal 2/3 of femora brownish, legs otherwise yellow.

Wings. Membrane hyaline. Basal cells of fore wing nearly glabrous, with only few scattered setae. Cell 1M weakly convex posteriorly, corner posteroapical.

Measurements. LFW 2.44 mm; LM 1.20 mm; WH/LH 0.76 (0.75–0.78); DH/LH 0.53 (0.53–0.54); EV/HE 1.08 (1.08–1.19); EV/WF 0.81 (0.81–0.91); WF/HE 1.34 (1.23–1.39); WH/WF 1.66 (1.63–1.68); OOL/WOT 1.65 (1.65–2.03); DM/LM 0.43; FL/FW 2.05 (1.78–2.08); HFL/HFW 2.61 (2.34–2.70); A3 L/W 1.58 (1.35–1.58); 2R1 L/W 3.3. N = 6.

Type Material. Holotype ♀. Hawai‘i: Kīlauea 29 miles, 19 Nov 1913, D.T. Fullaway, BPBMENT 0000018125. Paratypes: 1♀, Hualālai, 5 Aug 1892, R.C.L. Perkins, BPBM. 3♀, Kīlauea, Aug 1895, R.C.L. Perkins, NHMUK 013380221, 013380222, 013380248.

Additional (non-type) material: 1♀, “Honolulu,” Nov 1896, R.C.L. Perkins, NHMUK 013380223 [mislabeled?].

Etymology. From the Hawaiian *pili*, close together or mimicking, from the close similarity of this species to *S. ihupehu* n. sp. and their sympatric distribution.

Distribution. Rare, only definitely known from five specimens, all but one from Kīlauea. Last collected in 1913.

Discussion. One specimen from NHMUK is labelled as being from Honolulu, O‘ahu; it is almost certainly mislabeled, as there are three other specimens from Hawai‘i with it and nothing similar been found on O‘ahu despite much more intensive collecting there. The specimen from Hualālai has the clypeal apex broadly transverse, more like *S. ihupehu*, but otherwise matches *S. pili*. The wide variance in OOL/WOT is largely due to variation in the width of the ocellar triangle.

***Sierola pohaku* n. sp.**

Figure 89

Island. Hawai‘i.

Diagnosis. Forming a species complex with *S. mamua* n. sp. and *S. rocki* Fullaway, united by having the head broad and ventrally strongly convex or angulately produced, frons smooth and shining, clypeus lacking a carina and evenly curved in profile, basal wing cells glabrous to sparsely setose, and mandible yellow to reddish brown. Distinguished from the other two species by the nearly glabrous basal wing cells, flat clypeus, yellow mandible which is parallel-sided, and head only moderately convex both dorsally and ventrally.

Description. **Female**. *Head*. Clypeal process semicircular, apex broadly rounded; dorsally flat, not carinate, slightly convex only laterally; in profile evenly curved from base to apex, apical angle slightly acute. Mandible moderately narrow, more or less parallel-sided except at base; not twisted, at most weakly convex outwardly, outwardly polished, smooth, shining. Apex of mandible vertical, with equally strong teeth. Malar space very small. Dorsal setae of head shorter than flagellar width. Frons with distinct, uneven punctures, 1–3 pit widths apart. Vertex and gena setae similar to and only slightly longer than setae of frons. Frons microsculpture evident but smooth, shining. Vertex in dorsal view broadly, shallowly concave; occipital margin narrowly rounded. Lateral ocelli nearly touching vertex crest. Ocellar triangle front angle right to weakly obtuse. Head rounded shortly posterior to eyes. Dorsum of head in lateral view slightly convex, head deepest on line through posterior mar-

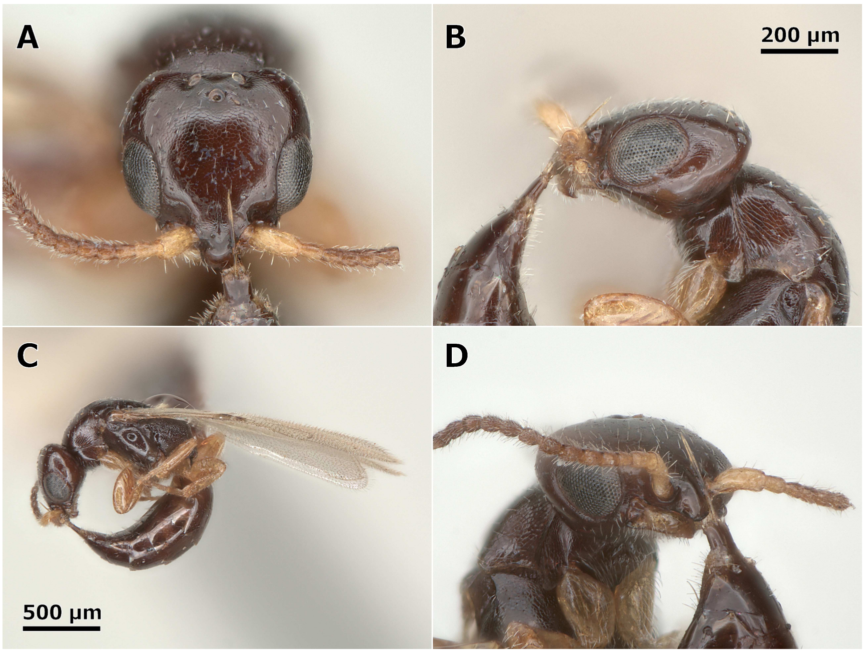


Figure 89. *Sierola pohaku*. A: head, dorsal. B: head, lateral. C: lateral habitus. D: head, frontal.

gin of eye. Venter of head posterior to mandible convex in lateral view, with relatively sparse setae. Genal angle broadly rounded. Postgenal depression shallow, rounded. Antenna extending to mesonotum.

Mesosoma. Anterior margin of dorsal pronotal area in lateral view evenly rounded. Pronotal setae short, inconspicuous. Propodeal disc laterally coarsely rugulose; transverse carina faintly present, curving on each side; metapleural carinae complete. Fore femur only moderately expanded, more than twice as long as wide, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with very faint microreticulation over posterior terga. Sixth sternum narrowly glabrous medially, laterally with dense pilose setae.

Color. Body entirely dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible yellow. Legs all yellow.

Wings. Membrane hyaline. Basal cells of fore wing nearly glabrous, with only few scattered setae.

Measurements. LFW 1.68 mm; LM 0.79 mm; WH/LH 0.92; DH/LH 0.58; EV/HE 0.78; EV/WF 0.57; WF/HE 1.38; WH/WF 1.64; OOL/WOT 1.17; DM/LM 0.50; FL/FW 2.17; HFL/HFW 2.32; A3 L/W 1.23; 2R1 L/W 3.2.

Type Material. Holotype ♀. Hawai‘i: S. Kona, *Straussia* [= *Psychotria*], 8 Aug 1919, O.H. Swezey, BPBMENT 0000018126. Paratype: 1♀, S. Kona, *Wikstroemia*, 8 Aug 1919, O.H. Swezey, BPBM.

Etymology. From the Hawaiian *pōhaku*, rock or stone. This was the nickname of Joseph Rock, for whom the closely related *S. rocki* was named.

Distribution. Known only from two specimens, taken on the same day in 1919.

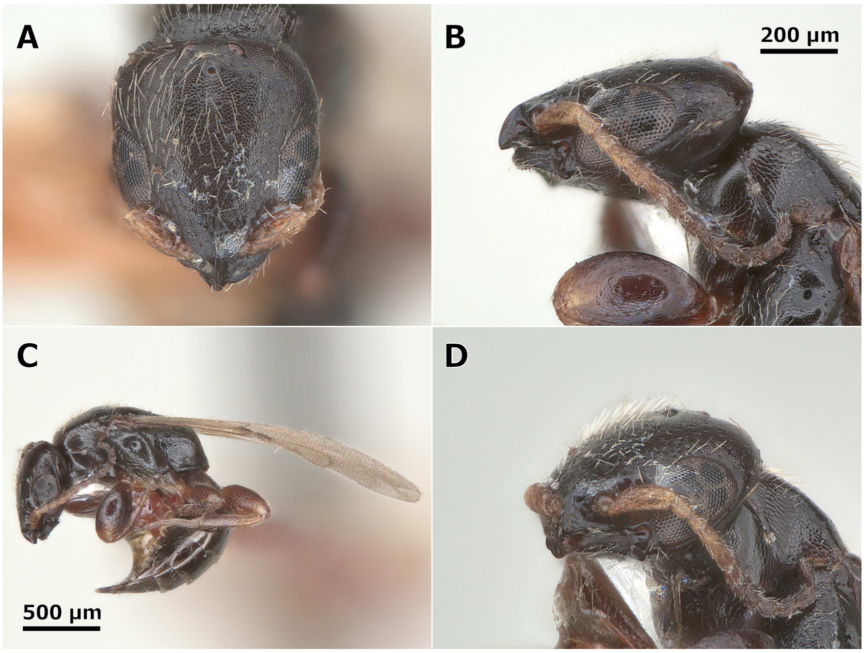


Figure 90. *Sierola pokii*. A: head, dorsal. B: head, lateral. C: lateral habitus. D: head, frontal.

Sierola pokii **n**. **sp**.

Figure 90, Map 16

Island. Hawaiʻi.

Diagnosis. Belonging in the group of species with a highly arched, thin clypeal carina, strong, conspicuous vertex and gena setae, and densely punctate frons. Separated from *S. ehrhorni* and *S. eucrena* by having the lateral ocelli nearly touching the vertex crest, and from *S. indecora* by OOL/WOT greater than 1.20 and having the metasoma mostly polished dorsally and in at least some areas ventrally. Closest to *S. kilauea* and *S. scoriacea*, distinguished by the slightly concave vertex crest and clypeus triangular, more elongate and apically evenly curved in profile; additionally separated from the former by the broad femora (FL/FW 1.85–2.00, HFL/HFW 2.25–2.50).

Description. **Female**. *Head*. Clypeal process triangular, apex weakly pointed; dorsally with a thin, laminar carina, the sides strongly concave; in profile elongate, flat at base, evenly curved on apical half. Mandible narrow, more or less parallel-sided except at base; apical half of mandible strongly convex outwardly, teeth arrayed on frontal and dorsal surfaces, outwardly coriaceous, somewhat dull; in ventral view evenly, moderately curved. Apex of mandible vertical, with equally strong teeth. Malar space very small. Dorsal setae of head distinctly longer than flagellar width. Frons with shallow, close punctures, mostly less than 1 pit width apart. Vertex and gena setae conspicuous, nearly twice as long as setae of frons and stronger, erect and directed anterior. Frons microsculpture coriaceous, matte but without strong surface texture. Vertex in dorsal view very slightly concave; occipital margin narrowly rounded. Lateral ocelli nearly touching vertex crest. Ocellar triangle front angle right. Head more or less parallel-sided for some distance posterior to eyes. Dorsum of head in lateral view slightly convex, head deepest on line through eye. Venter of head posterior to mandible convex in lateral view, with relatively sparse setae. Head evenly convex ventrally, genal angle absent. Gena ventral to eye flat. Postgenal depression absent. Antenna extending to posterior margin of pronotum.

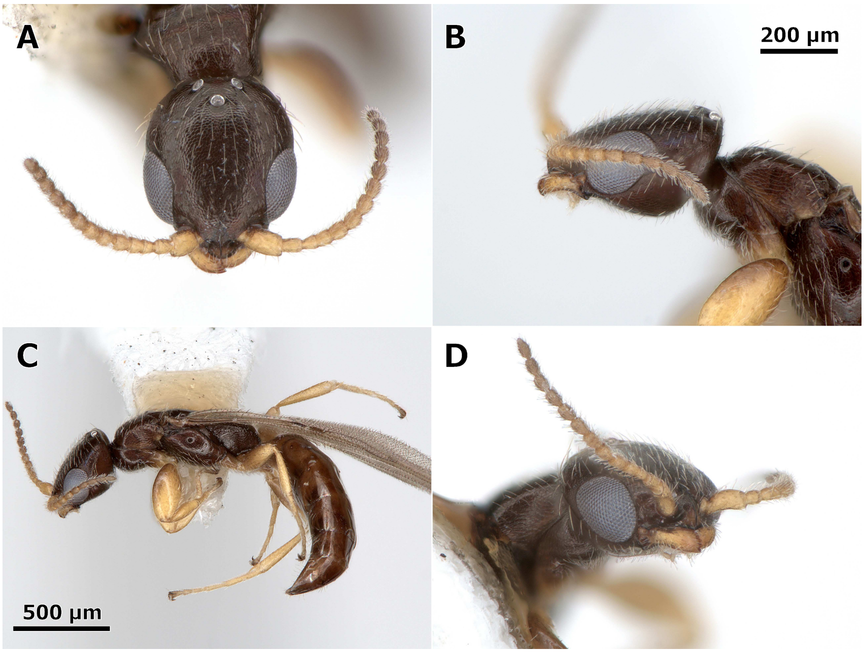


Figure 91. *Sierola pololei*. A: head, dorsal. B: head, lateral. C: lateral habitus. D: head, frontal.

Mesosoma. Anterior margin of dorsal pronotal area in lateral view evenly rounded. Pronotal setae longer than flagellar width. Propodeal disc laterally coarsely striate; metapleural carinae complete. Fore femur strongly expanded, less than twice as long as wide, with both anterior and posterior surfaces convex, not strongly compressed, more or less straight in dorsal view.

Metasoma. Shining, apical tergites laterally punctate and with faint microreticulation. Sixth sternum narrowly glabrous medially, laterally with dense pilose setae.

Color. Body entirely dark brown to black. Antenna with scape dark brown basally, yellow to orange apically, flagellum brown dorsally and yellow ventrally. Mandible black. Coxae and femora dark brown to black, tibiae, tarsi, and trochanters brownish orange.

Wings. Membrane tinged with yellow. Basal cells of fore wing densely and conspicuously setose. Cell 1M weakly convex posteriorly, corner posteroapical.

Measurements. LFW 2.18 mm; LM 1.08 mm; WH/LH 0.80; DH/LH 0.55; EV/HE 0.73; EV/WF 0.65; WF/HE 1.13; WH/WF 0.66; OOL/WOT 1.38; DM/LM 0.43; FL/FW 1.86; HFL/HFW 2.29; A3 L/W 1.43; 2R1 L/W 2.66.

Type Material. Holotype ♀. Hawai‘i: Kīlauea, 4,000 ft [1,220 m], Collection of W.M. Giffard, Aug 1896, A. Koebele, BPBMENT 0000018127.

Etymology. From the Hawaiian *pōki‘i*, younger sibling or cousin, referring to the close relationship of this species to *S. kilauea* and *S. scoriacea*.

Distribution. Rare, known only from two specimens taken at Kīlauea in 1896.

Discussion. See comments under *S. scoriacea*.

***Sierola pololei* n. sp.**

Figure 91, Map 18

Island. Hawai‘i.

Diagnosis. A relatively distinct species, with the posterior corners of the head strongly rounded in dorsal view, sharp clypeal carina, relatively deep head (DH/LH 0.59–0.63), and mandible yellow and narrow. Despite keying out in multiple places and with complex character combinations, it is easily recognized by the general appearance of the head, particularly the very weakly convex dorsum and distinct genal angle ventrally. The only other Hawai‘i species with sparsely setose basal wing cells and the mandible yellow, *S. nukupio* n. sp. and certain specimens included under *S. puuwaawaa* Fullaway, have the head more strongly convex dorsally and evenly convex ventrally. Similar to *S. tenebriosa* of O‘ahu, differing in having the basal wing cells sparsely setose except at the apex of cell R, and frons finely microreticulate rather than dull and granular. Nearly identical to *S. croceipes*, separated by the closed cell 2R1 of the fore wing.

Description. **Female**. *Head*. Clypeal process semi-elliptical, apex broadly rounded; dorsally with a sharp carina; in profile evenly curved from base to apex, apical angle slightly acute. Mandible narrow, slightly expanded at base and apex, ventral margin weakly concave; not twisted, at most weakly convex outwardly, outwardly coriaceous, somewhat dull; in ventral view evenly, moderately curved. Apex of mandible vertical, with equally strong teeth. Malar space almost absent. Dorsal setae of head distinctly longer than flagellar width. Frons with distinct, uneven punctures, 1–3 pit widths apart. Vertex and gena setae distinctly longer than frons setae but only about as thick, not particularly conspicuous. Frons microsculpture finely microreticulate, surface weakly matte. Vertex in dorsal view more or less straight, corners strongly rounded off; occipital margin narrowly rounded. Lateral ocelli nearly touching vertex crest. Ocellar triangle front angle right to weakly acute. Head rounded shortly posterior to eyes. Dorsum of head in lateral view slightly convex, head deepest on line through posterior margin of eye. Venter of head posterior to mandible flat in lateral view, with relatively sparse setae. Genal angle broadly rounded. Gena ventral to eye flat. Postgenal depression very shallow, nearly absent. Antenna extending to posterior margin of pronotum.

Mesosoma. Anterior margin of dorsal pronotal area in lateral view evenly rounded. Pronotal setae longer than flagellar width. Propodeal disc laterally finely, weakly striate; metapleural carinae complete. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with faint microsculpture laterally. Sixth sternum broadly glabrous medially, with sparse setae laterally.

Color. Body entirely dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible yellow. Legs all yellow except dorsal margins of femora tinged with brown or coxae and hind femur brown, other femora brown dorsally, legs otherwise yellow.

Wings. Membrane weakly infuscate. Basal cells of fore wing sparsely setose, cell R somewhat densely setose apically. Cell 1M weakly convex posteriorly, corner posteroapical.

Measurements. LFW 1.96 mm; LM 0.85 mm; WH/LH 0.87 (0.84–0.90); DH/LH 0.61 (0.59–0.63); EV/HE 0.82 (0.73–0.87); EV/WF 0.74 (0.64–0.78); WF/HE 1.11 (1.03–1.19); WH/WF 1.76 (1.65–1.85); OOL/WOT 1.35 (1.24–1.44); DM/LM 0.38; FL/FW 2.13 (1.92–2.14); HFL/HFW 2.45 (2.23–2.60); A3 L/W 1.20 (1.00–1.30); 2R1 L/W 3.47. N = 17.

Type Material. Holotype ♀. Hawai‘i: Kealakekua Ranch, 3,400 ft [1,040 m], 19.5040°N 155.8624°W, beating *Pisonia brunoniana*, 16 Mar 2012, K.N. Magnacca, BPBMENT 0000018128. Paratypes: 3♀, Kohala Mts., 24 May 1917, O.H. Swezey, BPBM. 1♀, S. Kona, 8 Aug 1919, O.H. Swezey, BPBM. Upper Hāmākua Ditch Trail, O.H. Swezey, BPBM: 1♀, *Lobelia*, 3 Sep 1919; 1♀, 5 Sep 1919; 1♀, *Clermontia*, 30 Jul 1921; 1♀, 1 Oct 1929; 1♂, Pipturus, 1 Oct 1929; 1♀, *Gouldia* [=*Kadua*]. 2♀ 2♂, Nauhi Gulch, 5,000–6,000 ft [1,520–1,830 m], *Cheirodendron*, 30 Sep 1931, O.H. Swezey & F.X. Williams, BPBM. 1♀ 1♂, Nauhi Gulch, 5000–6000 ft [1520–1830 m], 2 Oct 1931, O.H. Swezey & F.X. Williams, BPBM. 1♀, Mt Hualālai, 4,000 ft [1,220 m], Capt. Cook above, 12 May 1959, C.M. Yoshimoto, BPBM. 2♀, Kīpuka N. side Hualālai, 5,300 ft [1,620 m], 14 Jul 1965, D.E. Hardy, BPBM. 1♀, Pu‘u Hualālai, 900–1,200 m, 27–28 Jun 1966, J.W. Beardsley, BPBM. 1♀, Mt Hualālai, 2,500 ft [760 m], 28 Jun 1966, J.W. Beardsley, BPBM. 1♀, Hualālai, 6 Jul 1967, J.A. Tenorio, BPBM. 2♀, Laupāhoehoe Forest Reserve, 1,219 m, fogging *Metros. polymorpha*, 6 Jun 1997, D.S. Gruner (specimens: B2–1, GRU 5075–002; B3–3, GRU 5187–002), BPBM. 3♀, Kohala Forest Reserve, 1,158 m, fogging *Metros. polymorpha*, 12 Oct 1997, D.S. Gruner & D.A. Polhemus (specimens: 1–2, GRU 0454–010; 5–1, GRU 0589–008; 7–2, GRU

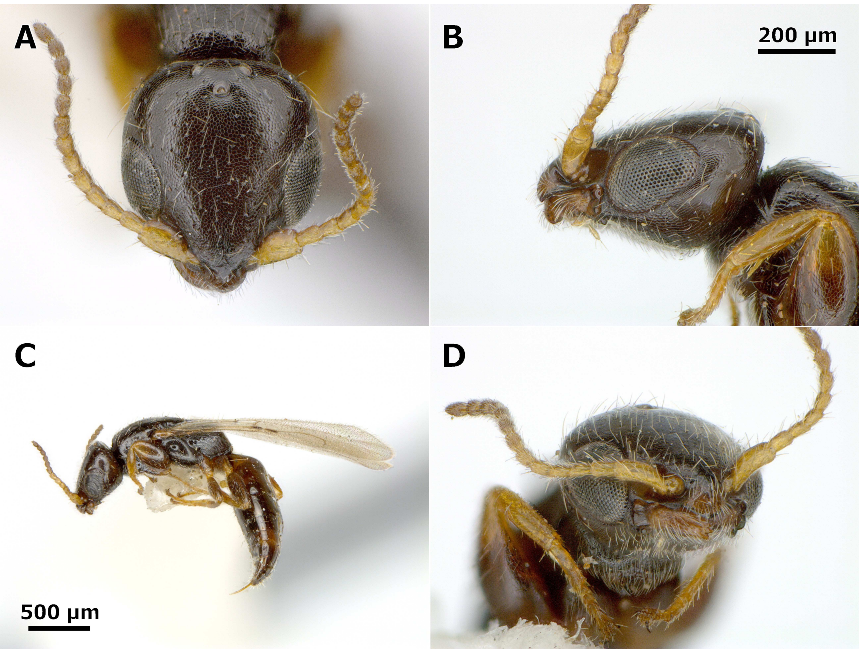


Figure 92. *Sierola puaa*. A: head, dorsal. B: head, lateral. C: lateral habitus. D: head, frontal.

0652–011), BPBM. 1♀, Laupāhoehoe Forest Reserve, 1,219 m, fogging *Metros. polymorpha*, B4–1, GRU 5214–002, 6 Nov 1997, D.S. Gruner, BPBM. 1♀, Upper Waiākea FR, kīpuka 6, 1,638 m, 19.6697°N 155.3583°W, canopy Malaise trap, collection K6-C-M, lot HI-1449, 20 Jul 2009, J. Riley & E. Parissenti, USNM. 4♀, Pu‘u Wa‘awa‘a, 4,950 ft [1,510 m], 19.7316°N 155.8944°W, sweeping, 4 Aug 2009, K.N. Magnacca, BPBM. 3♀, Kealakekua Ranch, 3,400 ft [1,040 m], 19.5040°N 155.8624°W, beating *Pisonia brunoniana*, 16 Mar 2012, K.N. Magnacca, BPBM. 2♀, Pāpā mid road, 1230 m, 19.2118°N 155.8169°W, Townes Malaise trap, H22080401–04, 1 Jul–4 Aug 2022, K.N. Magnacca, BPBM. 2♀, Kukuiopa‘e upper, 1,400 m, 19.3047°N 155.8196°W, Townes Malaise trap, H22102501–17, 11 Aug–25 Oct 2022, K.N. Magnacca, BPBM.

Etymology. From the Hawaiian *pololei*, correct, referring to this species having cell 2R1 fully closed as normal for *Sierola*, compared to the open cell of the similar *S. croceipes*.

Distribution. Common and widespread on the north and west sides of the island in wet to mesic forest; notably absent from the Kīlauea–Ka‘ū region. It sometimes occurs in large numbers, particularly when sweeping ferns in the vicinity of *Clermontia* trees.

Discussion. I am somewhat reluctantly describing this species despite its near-identity with *S. croceipes* based primarily on the open cell 2R1 in that species. This trait is common among the Australian *Sierola* and also found in a few species from O‘ahu (Magnacca, 2020), but intraspecific variation has not been seen anywhere. WH/LH, FW/FL, and A3 L/W for the available *S. croceipes* are also on or slightly outside the range of variation seen in a large series of specimens considered as *S. pololei*. One specimen has the prothorax yellow.

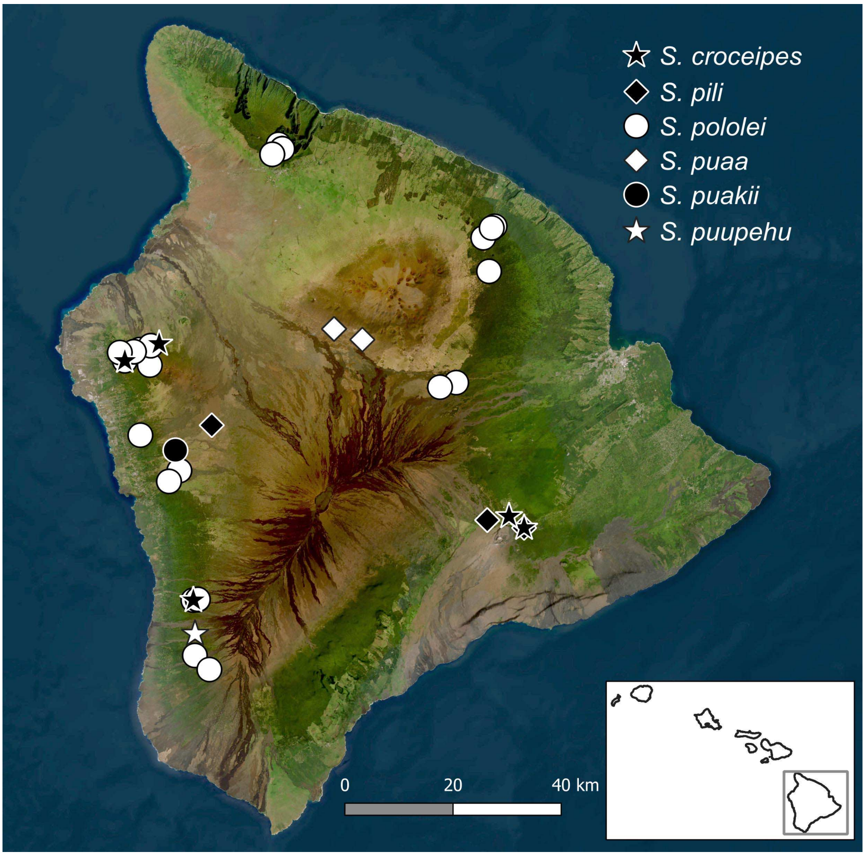
Sierola puaa n. sp.

Figure 92, Map 18

Island. Hawai‘i.

Diagnosis. Immediately recognizable by the strongly convex clypeus, which is covered with conspicuous setae.

Description. **Female**. *Head*. Clypeal process semicircular (rather large), apex rounded; dorsally rounded, convex, lacking a carina (conspicuously covered with short setae all over);



Map 18. Collection localities of *Sierola croceipes, S. pili, S. pololei, S. puaa, S. puakii*, and *S. puupehu*.

in profile evenly curved from base to apex, apical angle slightly acute. Mandible moderately narrow, more or less parallel-sided except at base; not twisted, at most weakly convex outwardly, outwardly coriaceous, somewhat dull; in ventral view evenly, moderately curved. Apex of mandible vertical, with equally strong teeth. Malar space almost absent. Dorsal setae of head distinctly longer than flagellar width. Frons with shallow, uneven punctures, 1–3 pit widths apart. Vertex and gena setae distinctly longer than frons setae but only about as thick, not particularly conspicuous. Frons microsculpture finely microreticulate, surface weakly matte. Vertex in dorsal view more or less straight; occipital margin broadly rounded. Lateral ocelli distinctly separate from vertex crest by less than ocellus length. Ocellar triangle front angle right. Head rounded shortly posterior to eyes. Dorsum of head in lateral view slightly convex, head deepest on line through posterior margin of eye. Venter of head posterior to mandible flat in lateral view, with moderately dense pubescence. Genal angle broadly rounded. Gena ventral to eye flat. Postgenal depression shallow, rounded. Antenna extending to pronotum.

Mesosoma. Anterior margin of dorsal pronotal area in lateral view weakly angulate. Pronotal setae longer than flagellar width. Propodeal disc laterally coarsely striate; metapleural carinae complete. Fore femur strongly expanded, less than twice as long as wide, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with faint microsculpture laterally. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Body entirely dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible reddish brown to orange. Coxae and

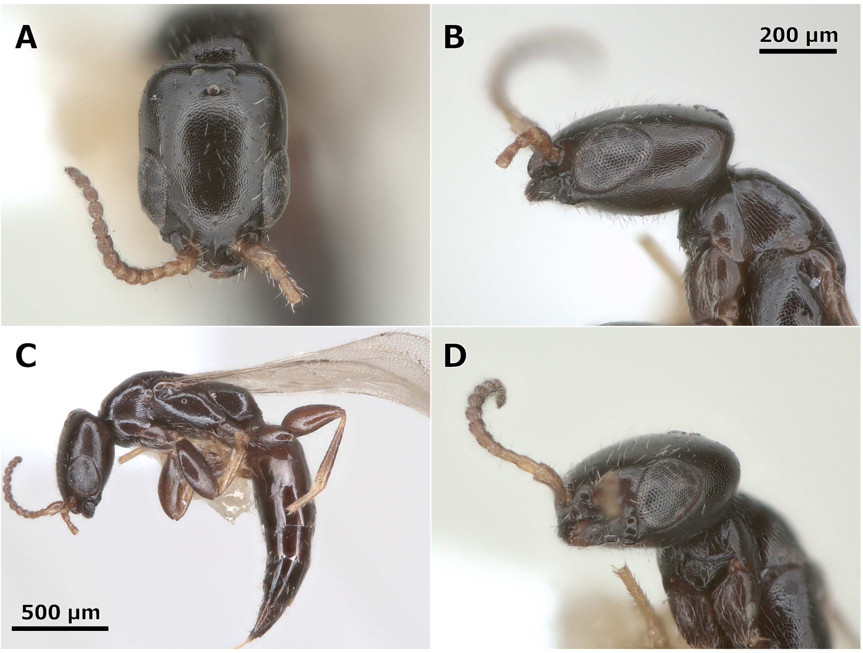


Figure 93. *Sierola puakii*. A: head, dorsal. B: head, lateral. C: lateral habitus. D: head, frontal.

femora dark brown to black, tibiae dark brown, trochanters, tarsi, and bands at bases and apices of tibiae orange.

Wings. Membrane hyaline. Basal cells of fore wing sparsely setose, with one or two rows of setae in each cell.

Measurements. LFW 1.95 mm; LM 0.98 mm; WH/LH 0.88; DH/LH 0.59; EV/HE 0.69; EV/WF 0.59; WF/HE 1.17; WH/WF 1.71; OOL/WOT 1.34; DM/LM 0.39; FL/FW 1.86; HFL/HFW 2.45; A3 L/W 1.48; 2R1 L/W 2.74.

Type Material. Holotype ♀. Hawai‘i: Pōhakuloa, 1,800 m, 21 Jun 1966, J.W. Beardsley, BPBMENT 0000018129. Paratypes: 1♀, near Humu‘ula, *Sophora*, 7 Aug 1946, E.C. Zimmerman, BPBM. 2♀ 1♂, Pōhakuloa, 1,800 m, 2 May 1966, J.W. Beardsley, BPBM. 2♀, Pōhakuloa, 1,800 m, 21 Jun 1966, J.W. Beardsley, BPBM. 3♀, Pōhakuloa, 1,800 m, 25 Jun 1966, C.M. Yoshimoto, BPBM.

Etymology. From the Hawaiian *pua‘a*, pig, referring to the unusual setose, rounded clypeus resembling a pig's snout.

Distribution. Known from about 10 specimens from the Pōhakuloa–Humu‘ula saddle region; last collected in 1966.

Discussion. The strongly setose clypeus appears to be unique to this species, and makes it easily recognizable.

Sierola puakii n. sp.

Figure 93, Map 18

Island. Hawai‘i.

Diagnosis. Separated from most other species by the small size, clypeus with a sharp carina and somewhat rounded in profile, basal wing cells sparsely setose to intermediate, and head narrow and elongate behind the eyes. Closest to *S. iki* n. sp., distinguished by having the vertex slightly but distinctly concave in dorsal view, lateral ocelli distinctly separate from vertex crest, and head narrower, WH/LH ~0.73 vs. 0.79–0.81. Both are also similar to *S. maiki* n. sp., which has the head shorter behind the eyes and the posterior corners strongly rounded.

Description. **Female**. *Head*. Clypeal process semicircular, apex rounded; dorsally with a sharp carina; in profile weakly sloping dorsally but strongly rounded and recurved at apex. Mandible moderately narrow, slightly narrowed medially from base, ventral margin weakly concave; not twisted, at most weakly convex outwardly, outwardly coriaceous, somewhat dull; in ventral view evenly, moderately curved. Apex of mandible vertical, with equally strong teeth. Malar space almost absent. Dorsal setae of head about as long as flagellar width or scarcely longer. Frons with sparse, scattered punctures, mostly 3 pit widths apart or more (slightly closer near antennae). Vertex and gena setae similar to and only slightly longer than setae of frons. Frons microsculpture finely microreticulate, surface weakly matte. Vertex in dorsal view very slightly concave; occipital margin broadly rounded. Lateral ocelli distinctly separate from vertex crest by less than ocellus length. Ocellar triangle front angle weakly acute. Head more or less parallel-sided for some distance posterior to eyes. Dorsum of head in lateral view slightly convex or nearly flat posterior to middle of eyes, head deepest on line through posterior margin of eye. Venter of head posterior to mandible convex in lateral view, with relatively sparse setae. Head weakly convex ventrally, genal angle absent. Postgenal depression very shallow, nearly absent. Antenna extending to pronotum.

Mesosoma. Anterior margin of dorsal pronotal area in lateral view almost evenly sloping, weakly curved. Pronotal setae longer than flagellar width. Propodeal disc laterally finely, weakly striate; metapleural carinae nearly absent, visible only beyond propodeal declivity. Fore femur only moderately expanded, more than twice as long as wide, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with faint microsculpture laterally. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Body entirely dark brown to black. Antenna yellow-brown. Mandible black. Coxae and femora dark brown to black, tibiae dark brown, trochanters, tarsi, and bands at bases and apices of tibiae orange.

Wings. Membrane hyaline. Basal cells of fore wing sparsely setose, with one or two rows of setae in each cell, or with intermediate setation, each with two complete rows and a few additional setae. Cell 1M weakly convex posteriorly, corner posteroapical.

Measurements. LFW 1.89 mm; LM 0.88 mm; WH/LH 0.73; DH/LH 0.54; EV/HE 0.95; EV/WF 0.88; WF/HE 1.09; WH/WF 1.61; OOL/WOT 1.71; DM/LM 0.37; FL/FW 2.19; HFL/HFW 2.43; A3 L/W 1.30; 2R1 L/W 3.33.

Type Material. Holotype ♀. Hawai‘i: Kona, 4,000 ft [1,220 m], 10 Aug 1892, R.C.L. Perkins, BPBMENT 0000018130.

Etymology. From the Hawaiian *puaki‘i*, skinny, referring to the slender body and head of this species.

Distribution. Known only from the holotype, collected in Kona in 1892.

***Sierola puupehu* n. sp.**

Figure 94, Map 18

Island. Hawai‘i.

Diagnosis. Easily recognized by the clypeus with a broad, rounded ridge, densely setose basal wing cells, and ocellar triangle right to obtuse with the lateral ocelli nearly touching the vertex crest. The posterior head is unusual, with the vertex rounding evenly to the occiput in lateral view rather than forming an angle. Superficially similar to *S. ihunana* n. sp., but differing substantially in the form of the mandible (reddish brown and twisted with the ventral tooth largest) and shape of the head, which is less convex dorsally but more so ventrally, with dense ventral setation, and deeper. The clypeus is also less highly arched in profile. Nearly identical to *S. haleiki* n. sp., separated by having the head shorter behind the eyes, deeper, and more strongly convex ventrally, overall giving a considerably different appearance.

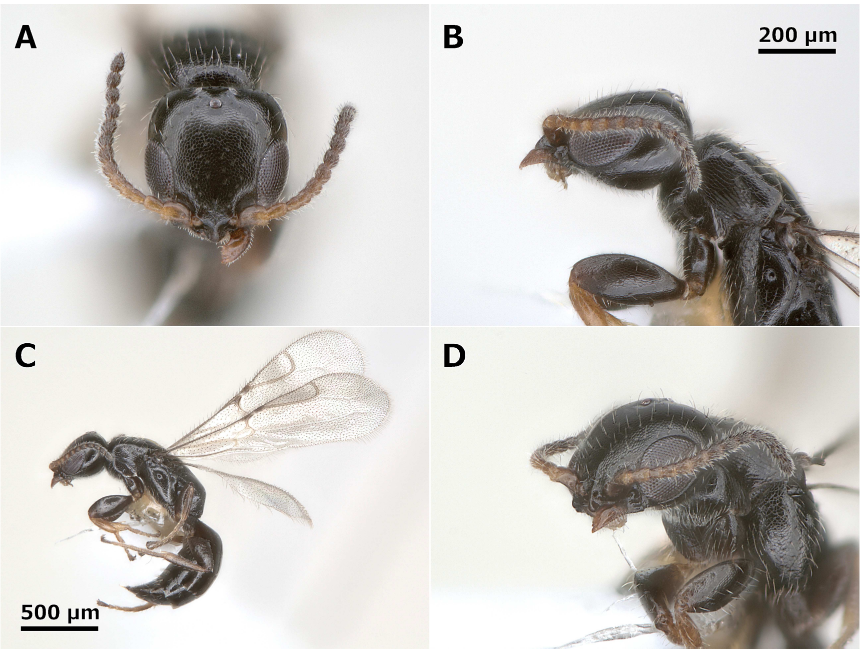


Figure 94. *Sierola puupehu*. A: head, dorsal. B: head, lateral. C: lateral habitus. D: head, frontal.

Description. **Female**. *Head*. Clypeal process rounded triangular, apex rounded; dorsally with a broad, rounded ridge; in profile evenly curved from base to apex, apical angle slightly acute (somewhat low and elongate). Mandible narrow, slightly expanded at base and apex, ventral margin weakly concave; strongly twisted, outwardly polished and shining distal of bend, coriaceous and dull basally; in ventral view obtusely elbowed. Apex of mandible slightly oblique, with a single large ventral tooth and a few small teeth on inner margin. Malar space very small. Dorsal setae of head about as long as flagellar width or scarcely longer. Frons with distinct, uneven punctures, 1–3 pit widths apart. Vertex and gena setae similar to and only slightly longer than setae of frons. Frons microsculpture finely microreticulate, surface weakly matte. Vertex in dorsal view very slightly concave; occipital margin broadly rounded. Lateral ocelli nearly touching vertex crest. Ocellar triangle front angle weakly obtuse. Head rounded shortly posterior to eyes. Dorsum of head in lateral view slightly convex, head deepest on line through posterior margin of eye. Venter of head posterior to mandible convex in lateral view, with moderately dense pubescence. Head strongly convex ventrally, genal angle absent. Postgenal depression very shallow, nearly absent. Antenna extending to posterior margin of pronotum.

Mesosoma. Anterior margin of dorsal pronotal area in lateral view weakly angulate. Pronotal setae longer than flagellar width. Propodeal disc laterally finely, weakly striate; metapleural carinae nearly absent, visible only beyond propodeal declivity. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with faint microsculpture laterally. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Body entirely dark brown to black. Antenna entirely dark brown except ventral side of basal segments yellowish. Mandible reddish brown. Coxae and femora dark brown to black, fore tibia and tarsus and all trochanters yellow, mid and hind tibiae and tarsi brownish.

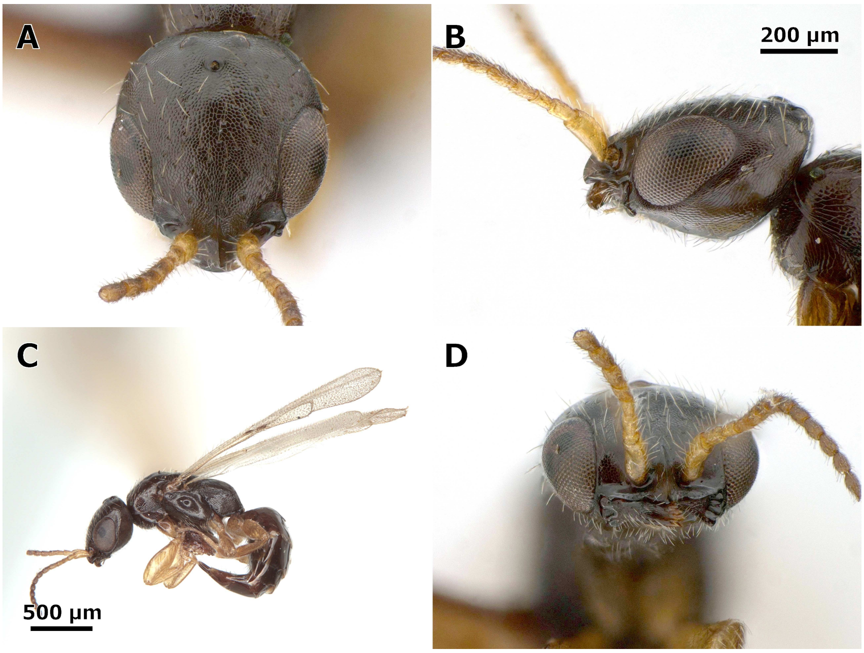


Figure 95. *Sierola puuwaawaa*. A: head, dorsal. B: head, lateral. C: lateral habitus. D: head, frontal.

Wings. Membrane hyaline. Basal cells of fore wing densely and conspicuously setose. Cell 1M weakly convex posteriorly, corner posteroapical.

Measurements. LFW 1.65 mm; LM 0.80 mm; WH/LH 0.89; DH/LH 0.64; EV/HE 0.64; EV/WF 0.63; WF/HE 1.03; WH/WF 1.80; OOL/WOT 1.17; DM/LM 0.39; FL/FW 2.07; HFL/HFW 2.25; A3 L/W 1.00; 2R1 L/W 2.83.

Type Material. Holotype ♀. Hawai‘i: Kīpāhoehoe mid kīpuka, 1,410 m, 19.2480°N 155.8166°W, Townes Malaise trap, 11 May–27 Jun 2022, K.N. Magnacca, BPBMENT 0000018131.

Etymology. From the Hawaiian *pu‘u*, throat or protuberance, + *pehu*, swollen, referring to the strongly convex ventral head.

Distribution. Known only from the holotype, collected in Kona in 2022.

Discussion. See comments under *S. haleiki* n. sp.

Sierola puuwaawaa Fullaway, 1920

Figure 95, Map 19

Sierola puuwaawaa Fullaway, 1920: 128.
Sierola quadriceps Fullaway, 1920: 138 **n. syn**.
Sierola vulcana Fullaway, 1920: 133 **n. syn**.

Island. Hawai‘i.

Diagnosis. Part of a complex of species with a sharp, evenly curved clypeal carina, broad head, long third antennal segment, and sparsely setose to glabrous basal wing cells. Very similar to *S. nukupio* n. sp., differing in having the basal wing cells sparsely setose with a complete row of setae. Also close to *S. koolau* n. sp. and *S. mawaena* n. sp., separated by the metasoma mostly polished and vertex not indented between the ocelli. Typically the mandible is black and clypeus not so prominent, but these characters vary. Close to *S. similis* Fullaway of O‘ahu, distinguished by having the head less convex above and below with the posterior corners strongly rounded, frons setae shorter, and lateral ocelli nearly touching the vertex crest.

Description. **Female**. *Head*. Clypeal process rounded triangular, apex rounded; dorsally with a sharp carina; in profile evenly curved from base to apex, apical angle slightly acute (rarely slightly recurved). Mandible moderately narrow, slightly narrowed medially from base, ventral margin weakly concave; not twisted, at most weakly convex outwardly, outwardly shining but with distinct, fine microsculpture; in ventral view weakly curved. Apex of mandible vertical, with equally strong teeth. Malar space very small. Dorsal setae of head distinctly longer than flagellar width. Frons with shallow, uneven punctures, 1–3 pit widths apart. Vertex and gena setae similar to and only slightly longer than setae of frons. Frons microsculpture dull, granular to coriaceous, matte but without strong surface texture (rarely finely microreticulate). Vertex in dorsal view more or less straight, corners strongly rounded off; occipital margin broadly rounded. Lateral ocelli nearly touching vertex crest. Ocellar triangle front angle right. Head rounded shortly posterior to eyes. Dorsum of head in lateral view slightly convex, head deepest on line through eye. Venter of head posterior to mandible convex in lateral view, with relatively sparse setae. Head evenly convex ventrally, genal angle absent. Postgenal depression very shallow, nearly absent. Antenna extending to posterior margin of pronotum.

Mesosoma. Anterior margin of dorsal pronotal area in lateral view weakly angulate. Pronotal setae longer than flagellar width. Propodeal disc laterally coarsely striate; metapleural carinae complete. Fore femur only moderately expanded, more than twice as long as wide, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Highly polished, without a trace of microsculpture. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Body entirely dark brown to black (clypeus sometimes tinged with yellow). Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible black (rarely yellow). Legs all yellow except dorsal margins of femora tinged with brown or coxae and femora dark brown to black, tibiae, tarsi, and trochanters yellow or tibiae dark brown, trochanters, tarsi, and bands at bases and apices of tibiae orange.

Wings. Membrane tinged with yellow. Basal cells of fore wing sparsely setose, with one or two rows of setae in each cell.

Measurements. LFW 2.10 mm; LM 1.00 mm; WH/LH 0.92 (0.88–0.98); DH/LH 0.59 (0.58–0.63); EV/HE 0.63 (0.51–0.73); EV/WF 0.58 (0.47–0.69); WF/HE 1.08 (1.02–1.15); WH/WF 1.73 (1.70–1.83); OOL/WOT 1.17 (1.09–1.27); DM/LM 0.42; FL/FW 2.33 (2.18–2.55); HFL/HFW 2.48 (2.34–2.86); A3 L/W 1.71 (1.37–1.83). N = 21.

Type Material. Holotype ♀ of *Sierola puuwaawaa*. Hawai‘i: Pu‘u Wa‘awa‘a, 3,700–3,800 ft [1,130–1,160 m], type numbered 14, 24 Aug 1917, W.M. Giffard, BPBMENT 0000000111.

Holotype ♀ of *Sierola quadriceps*. Hawai‘i: Pu‘u Wa‘awa‘a, 3,700 ft [1,130 m], Aug 1917, W.M. Giffard, BPBMENT 0000000131.

Holotype ♀ of *Sierola vulcana*. Hawai‘i: Kīlauea, 4,000 ft [1,220 m], at lumber camp, 19 Jul 1918, W.M. Giffard, BPBMENT 0000000121.

Material examined: 1♀, Kīlauea, Aug 1895, R.C.L. Perkins, NHMUK 013380204 [right specimen on card]. 1♀, Kīlauea, Aug 1896, R.C.L. Perkins, NHMUK 013380253. 1♀, Kīlauea, Jul 1906, R.C.L. Perkins, BPBM. 1♀, woods above McC.[andless] & D.[illingham] ranch, 7,000 ft [2,130 m], 1921, G.P. Wilder, BPBM. 1♀, Kīlauea, Kīpuka Puaulu, ex *Suttonia* [= *Myrsine*], 28 Jun 1934, O.H. Swezey, BPBM. 1♀, Kahuku Ranch, 3,000 ft [900 m], Jul 1953, D.E. Hardy, BPBM. 1♀, Pōhakuloa, 10 Feb 1962, J.W. Beardsley, BPBM. 1♀, Kīpuka Kī, [Hawaii Volcanoes] National Park, 29 Jan 1963, D.E. Hardy, BPBM. 1♀, Ahumoa crater, 6,500 ft [1,980 m], 21 Jun 1966, J.W. Beardsley, BPBM. 1♀, Pu‘u Hualālai, 900–1,200 m, 27–28 Jun 1966, J.W. Beardsley, BPBM. 1♀, Mauna Loa Strip Rd at IBP study site, 5,400 ft [1,650 m], Pyrethrum sample #WCG 71-36 of *Acacia koa*, 8 Jul 1971, W.C. Gagné, BPBM. 29♀, Mauna Loa Strip Road, 4,300–6,600 ft [1,300–2,010 m], D-Vac sample ex *Acacia koa*, 19 Jul 1971–16 May 1974, J.W. Beardsley & J. Leeper, BPBM

Distribution. Found widely around the island, primarily in mesic to dry forest, especially at Kīlauea.

Ecology. A large number of specimens taken on *Acacia koa* suggests that it attacks caterpillars feeding on the seeds, such as *Cydia* and/or *Cryptophlebia*. It may also be associated with *Sophora chrysophylla* (which is fed on by related moths) in dry areas.

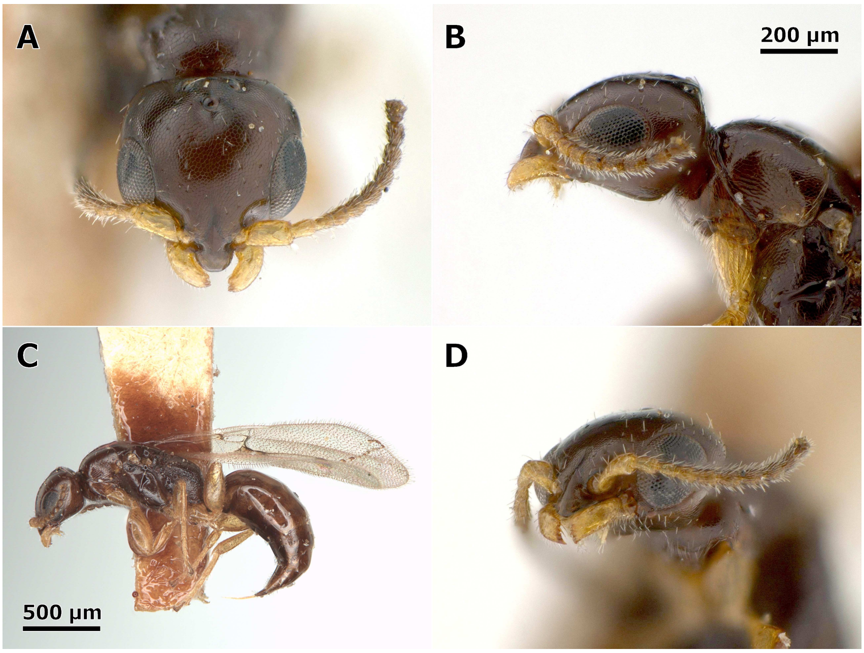
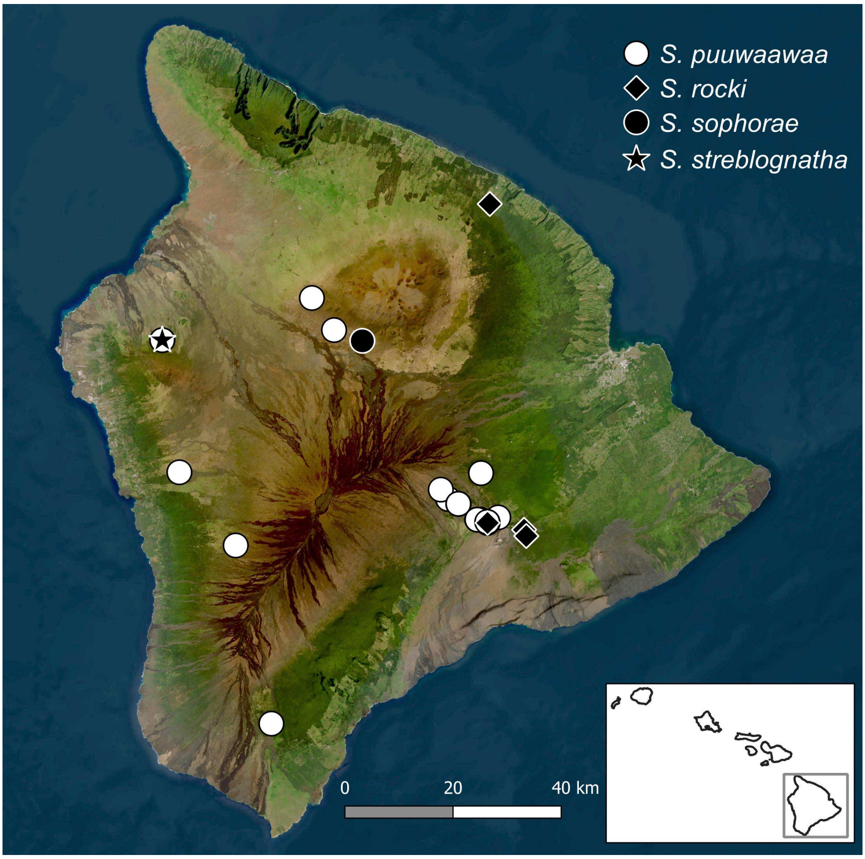


Figure 96. *Sierola rocki*. A: head, dorsal. B: head, lateral. C: lateral habitus. D: head, frontal.

Discussion. This is an unusually variable taxon that may represent a species complex or a set of host races or ecomorphs. Fullaway separated *S. puuwaawaa*, *S. quadriceps*, and *S. vulcana* based on the leg color (dark in *S. vulcana*), microsculpture (more shining in *S. vulcana*), and antennal length (shorter in *S. quadriceps*). Some specimens also have yellow mandibles. However, in examining a long series of specimens it is clear that these characters do not co-vary, nor do any of them correlate with any other differences. The holotype of *S. puuwaawaa* is closest to the mean in the range of variation for most characters, so I have selected it to represent the taxon. Specimens with all dark legs, corresponding to *S. vulcana*, are all from dry areas, but no other characters unite them; the microsculpture is as variable within the five dryland specimens as in the rest. One series with yellow mandibles, the clypeus more strongly arched, basal wing cells nearly glabrous, and generally narrower hind femora is segregated as *S. nukupio* n. sp.; it appears to inhabit wetter areas than *S. puuwaawaa*. Another series with shorter antennae and more setose basal wing cells, also from wet forest, is separated as *S. gruneri* n. sp. A number of orphan specimens are present which appear to differ from *S. puuwaawaa* in having the antenna shorter, the fore femur broader, or other minor characters, but they do not seem to exhibit enough of a consistent morphotype in other characters to justify describing as a separate species, especially in light of the considerable variation already seen. In contrast, the other related species (including *S. koolau* n. sp. and *S. mawaena* n. sp.) are remarkably uniform structurally. It is possible that a more extensive species complex is involved, represented by only a few specimens of each, and this species will need to be split up in the future. However, at present I do not see any further way it could be split up morphologically, and no recent specimens are available to analyze genetically.



Map 19. Collection localities of *Sierola puuwaawaa, S. rocki, S. sophorae*, and *S. streblognatha*.

Sierola rocki Fullaway, 1920

Figure 96, Map 19

Sierola rocki Fullaway, 1920: 81.

Island. Hawai‘i.

Diagnosis. Forming a species complex with *S. pohaku* n. sp. and *S. mamua* n. sp., united by having the head broad and ventrally strongly convex or angulately produced, frons smooth and shining, clypeus lacking a carina and evenly curved in profile, basal wing cells glabrous to sparsely setose, and mandible yellow to reddish brown. Distinguished from the other two species by the nearly glabrous basal wing cells, convex clypeus without a trace of an angle or carina, yellow mandible which is weakly concave ventrally, and head strongly convex dorsally and angulately produced ventrally. Nearly identical to *S. montana* Fullaway of O‘ahu, differing only in the slightly broader mandible, shallower postgenal depression, and longer setae of the head and pronotum.

Description. **Female**. *Head*. Clypeal process semicircular, apex broadly rounded; dorsally rounded, convex, lacking a carina; in profile evenly curved from base to apex, apical angle slightly acute. Mandible moderately narrow, slightly narrowed medially from base, ventral margin weakly concave; slightly twisted, outwardly coriaceous, somewhat dull; in ventral view evenly, moderately curved. Apex of mandible vertical, with equally strong teeth. Malar space very small. Dorsal setae of head shorter than flagellar width. Frons with sparse, scattered punctures, mostly 3 pit widths apart or more. Vertex and gena setae similar to and only slightly longer than setae of frons. Frons microsculpture evident but smooth, shining. Vertex in dorsal view more or less straight; occipital margin narrowly rounded. Lateral ocelli nearly touching vertex crest. Ocellar triangle front angle right. Head rounded shortly posterior to eyes. Dorsum of head in lateral view strongly convex, head deepest on line through eye. Venter of head posterior to mandible flat in lateral view, with relatively sparse setae. Genal angle prominent, apex rounded, head distinctly triangular in lateral view. Postgenal depression shallow, rounded. Antenna extending to posterior margin of pronotum.

Mesosoma. Anterior margin of dorsal pronotal area in lateral view evenly rounded. Pronotal setae about as long as flagellar width or scarcely longer. Propodeal disc laterally coarsely striate; transverse carina absent, brow of declivity broadly rounded, or faintly present, curving on each side; metapleural carinae complete. Fore femur only moderately expanded, more than twice as long as wide, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with faint microsculpture laterally. Sixth sternum evenly pilose, with dense short erect setae.

Color. Body entirely dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible yellow. Legs all yellow except dorsal margins of femora tinged with brown.

Wings. Membrane tinged with yellow. Basal cells of fore wing nearly glabrous, with only few scattered setae.

Measurements. LFW 1.83 mm; LM 0.88 mm; WH/LH 0.98; DH/LH 0.65; EV/HE 0.71; EV/WF 0.52; WF/HE 1.35; WH/WF 1.70; OOL/WOT 1.04; DM/LM 0.45; FL/FW 2.08; HFL/HFW 2.48; A3 L/W 1.17.

Type Material. Holotype ♀. Hawai‘i: 29 miles, Hilo-Ka‘ū road, 12 May 1913, D.T. Fullaway, BPBMENT 0000000020.

Material examined: 1♀ paratype, same data as holotype, BPBM. 1♀ 1♂, Kīlauea, Jul 1906, R.C.L. Perkins, BPBM. 1♀, Hawaii Volcanoes National Park, 1,200 m, fogging *Metros. polymorpha*, 7–1, GRU 1055–002, 7 Oct 1997, D.S. Gruner & D.A. Polhemus, BPBM. 1♂, same data, 8–6, GRU 1153–004, 8 Oct 1997, BPBM.

Distribution. Known from five specimens, three from before 1915 and two recent, all from the Kīlauea area.

Sierola scoriacea Fullaway, 1920

Figure 97, Map 10

Sierola scoriacea Fullaway, 1920: 101.

Island. Hawai‘i.

Diagnosis. Belonging in the group of species with a highly arched, thin clypeal carina, strong, conspicuous vertex and gena setae, and densely punctate frons. Separated from *S. ehrhorni* Fullaway and *S. eucrena* Fullaway by having the lateral ocelli nearly touching the vertex crest, and from *S. indecora* Fullaway by OOL/WOT greater than 1.20 and having the metasoma mostly polished dorsally and at least some areas ventrally. Closest to *S. kilauea* Fullaway and *S. pokii* n. sp.; distinguished from the former by having the femora broad (FL/FW 1.85–2.00, HFL/HFW 2.25–2.50), and from the latter by the straight vertex crest and clypeus rounded triangular, highly arched and blunt in profile.

Description. **Female**. *Head*. Clypeal process triangular, apex weakly pointed; dorsally with a thin, laminar carina, the sides strongly concave; in profile strongly arched, vertical or slightly recurved at apex, carina extending above antennal sockets. Mandible narrow, more or less parallel-sided except at base; apical half of mandible strongly convex outwardly, teeth arrayed on frontal and dorsal surfaces, outwardly coriaceous, somewhat dull; in ventral view obtusely elbowed. Apex of mandible vertical, with equally strong teeth. Malar space very small. Dorsal setae of head distinctly longer than flagellar width. Frons with shallow, close punctures, mostly about 1 pit width apart. Vertex and gena setae conspicuous, nearly twice as long as setae

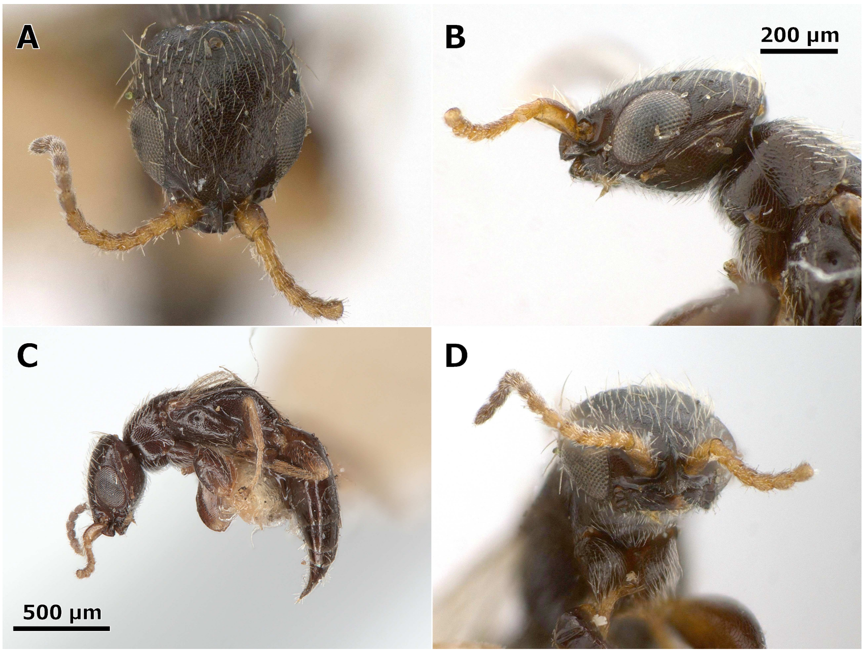


Figure 97. *Sierola scoriacea*. A: head, dorsal. B: head, lateral. C: lateral habitus. D: head, frontal.

of frons and stronger, erect and directed anterior. Frons microsculpture dull, granular. Vertex in dorsal view more or less straight; occipital margin broadly rounded. Lateral ocelli nearly touching vertex crest. Ocellar triangle front angle right. Head narrowed posterior to eyes. Dorsum of head in lateral view slightly convex, head deepest on line through eye. Venter of head posterior to mandible convex in lateral view, with relatively sparse setae. Head evenly convex ventrally, genal angle absent. Postgenal depression very shallow, nearly absent. Antenna extending to pronotum.

Mesosoma. Anterior margin of dorsal pronotal area in lateral view evenly rounded. Pronotal setae elongate, twice as long as flagellar width or more. Propodeal disc laterally coarsely striate; metapleural carinae present posteriorly, fading anteriorly. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Highly polished, without a trace of microsculpture. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Body entirely dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible black. Coxae and femora dark brown to black, tibiae, tarsi, and trochanters yellow.

Wings. Membrane tinged with yellow. Basal cells of fore wing densely and conspicuously setose.

Measurements. LFW 1.68 mm; LM 0.85 mm; WH/LH 0.84 (0.82–0.88); DH/LH 0.58 (0.55–0.58); EV/HE 0.75 (0.64–0.81); EV/WF 0.62 (0.55–0.70); WF/HE 1.20 (1.12–1.20); WH/WF 1.58 (1.58–1.70); OOL/WOT 1.42 (1.27–1.42); DM/LM 0.39; FL/FW 1.97 (1.88–1.97); HFL/HFW 2.50 (2.25–2.53); A3 L/W 1.16 (1.06–1.34); 2R1 L/W 2.78. N = 11.

Type Material. Holotype ♀. Hawai‘i: Ka‘ū, 3,600 ft [1,100 m], on ‘a‘ā flows, 18 Jul 1918, W.M. Giffard, BPBMENT 0000000058.

Material examined: 1♀, Kīlauea, Aug 1895, R.C.L. Perkins, BPBM. 1♀, Kīlauea, *Myoporum*, 27 Jun 1917, O.H. Swezey, BPBM. 2♀, Kīlauea, 4,000 ft [1,220 m], 9 Sep 1919, F.X. Williams, BPBM. 1♀, Kīlauea, Kīpuka Puaulu, ex *Xylosma*, 10 Jul 1934, O.H. Swezey, BPBM. 1♀, Pōhakuloa, 26 Jun 1963, D.E. Hardy, BPBM. 1♀, Forest No. of Pu'u Kapu, 2,800 ft [850 m], 24 Aug 1963, D.E. Hardy, BPBM. Kohala Forest Reserve, 1,158 m, fogging *Metros. polymorpha*, D.S. Gruner & D.A. Polhemus: 1♀, 1–2, GRU 0454–011, 12 Oct 1997; 1♀, 3–2, GRU 0506–006, 12 Oct 1997; 1♀, 6–3, GRU 0631–005, 12 Oct 1997; 1♀, 9–3, GRU 0725–007, 14 Oct 1997; 1♀, 10–3, GRU 0755–005, 14 Oct 1997; 1♀, 11–1, GRU 0769–002, 14 Oct 1997; 1♀, 11–2, GRU 0775–005, 14 Oct 1997, BPBM. 1♀, Kīpuka Kī, yellow sticky card, site #27, card E, 20 May 2003, BPBM. 1♀, Upper Waiākea FR, kīpuka 49, 1,695 m, 19.6728°N 155.3696°W, canopy Malaise trap, collection K49-C-M1, lot HI-0136, 8 Apr 2009, D. Leopold, UMD1♀, Upper Waiākea FR, kīpuka 31, 1,782 m, 19.6335°N 155.3695°W, 'ōhi'a canopy branch clipping, collection K31-TR3–2009, lot HI-1200, 7 Jul 2009, D. Leopold & B. Hwang, UMD. 2♀, Upper Waiākea FR, kīpuka 31, 1,782 m, 19.6335°N 155.3695°W, 'ōhi'a canopy branch clipping, collection K31-TR1–2010, lot HI-2161, 14 Jul 2010, D. Leopold & B. Hwang, UMD. 2♀, Pu'u Wa'awa'a, West Kīleo, 4,300 ft [1,300 m], 19.7345°N 155.8359°W, 26 Jan 2012, K.N. Magnacca, KNMC. 4♀ 3♂, Pu'u Wa'awa'a, West Kīleo, 4,300 ft [1,300 m], 19.7345°N 155.8359°W, beating *Santalum*, 27 Jan 2012, K.N. Magnacca, KNMC. 1♀, Upper Waiākea FR, kīpuka 14, 1,620 m, 19.6652°N 155.3484°W, 'ōhi'a canopy branch clipping, collection 369, lot H.12.436, 1 May 2012, E.E. Wilson & D. Leopold, UMD. 1♀, Upper Waiākea FR, kīpuka 26, 1,737 m, 19.6403°N 155.3616°W, 'ōhi'a canopy branch clipping, collection 387, lot H.12.466, 8 May 2012, E.E. Wilson & D. Leopold, UMD. 1♀, Pu'u Wa'awa'a, West Kīleo, 4,300 ft [1,300 m], 19.7345°N 155.8359°W, on Santalum, 10 May 2012, K.N. Magnacca, KNMC. 1♀, Pu'u Wa'awa'a, West Kīleo, 4,300 ft [1,300 m], 19.7345°N 155.8359°W, beating Santalum, 14 Aug 2012, K.N. Magnacca, KNMC.

Distribution. Widespread, apparently found mostly in drier sites than *S. kilauea*, the two sometimes found sympatrically.

Discussion. The male allotype does not match the female holotype; head shape and clypeus are very different. Species delimitation in this complex (including *S. ehrhorni*, *S. eucrena*, *S. indecora*, *S. kilauea*, and *S. pokii* n. sp.) is quite difficult and I expect future revisions to be made. For now, I have largely retained the species described by Fullaway (1920), though with some revisions to how they are distinguished. A more expansive definition might include all these under one species, but that seems to be lumping too much variation. Given what is seen on other islands, it seems more likely that there are unrecognized cryptic species, some of which may be more distinct if additional specimens were available. As with the *S. puuwaawaa* species complex, there are a number of specimens that cannot be assigned confidently to a species. Two with the mandible and femora yellow may represent a distinct species, but otherwise fit under *S. scoriacea*. Two others from 1896 a more elongate clypeus and triangular head like *S. nigrans* are separated out as *S. pokii* n. sp.

***Sierola sima* Fullaway, 1920**

Figure 98, Map 20

Sierola sima Fullaway, 1920: 76.
Sierola notabilis Fullaway, 1920: 75 **n. syn**.

Island. Hawai'i.

Diagnosis. Belonging to the group of species with the clypeus enlarged and weakly carinate or angulate dorsally. Separated from *S. aiwa* n. sp. and *S. winiwini* n. sp. by the quadrate clypeus which is truncate or slightly emarginate apically and almost evenly sloping in profile, broad reddish-brown mandible, head long behind the eyes, lateral ocelli separate from vertex crest by about their diameter, and sixth metasomal sternum evenly covered with anterior-directed pilose setae, lacking a median glabrous strip.

Description. **Female**. *Head*. Clypeal process quadrate, apex truncate; dorsally weakly carinate; in profile evenly sloping, nearly straight. Mandible moderately broad, slightly narrowed medially and expanded at apex, ventral margin weakly concave; slightly twisted, outwardly shining but with distinct, fine microsculpture; in ventral view evenly, moderately curved. Apex of mandible slightly oblique, with teeth distinctly stronger ventrally. Malar space almost absent. Dorsal setae of head about as long as flagellar width or scarcely longer. Frons with shallow, uneven punctures, 1–3 pit widths apart. Vertex and gena setae similar to and only slightly longer than setae of frons. Frons microsculpture coriaceous, matte but without strong surface

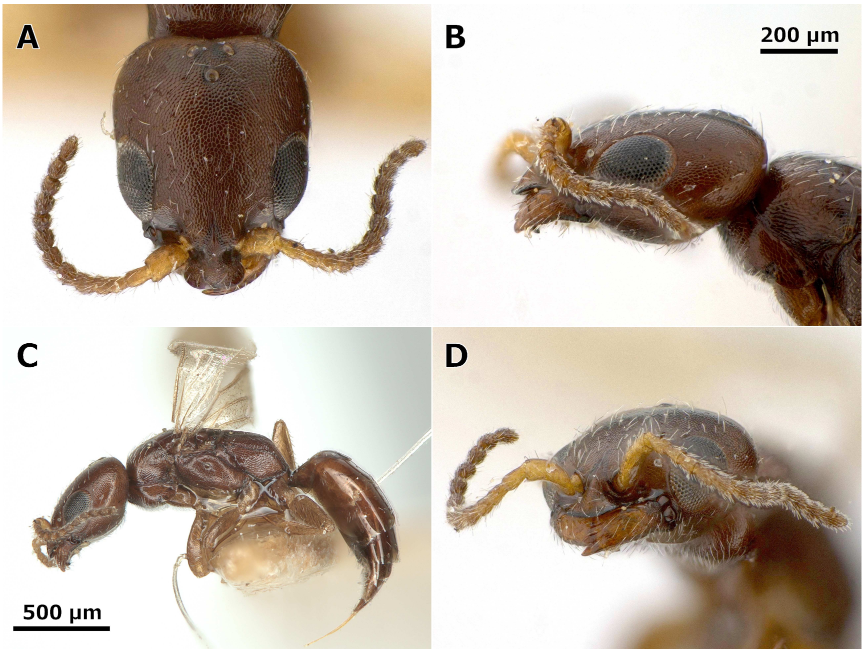


Figure 98. *Sierola sima*. A: head, dorsal. B: head, lateral. C: lateral habitus. D: head, frontal.

texture. Vertex in dorsal view very slightly concave; occipital margin broadly rounded. Lateral ocelli separated from vertex crest by about their own length. Ocellar triangle front angle strongly acute. Head broadening posterior to eyes. Dorsum of head in lateral view slightly convex, head deepest on line through posterior margin of eye. Venter of head posterior to mandible convex in lateral view, with relatively sparse setae. Head evenly convex ventrally, genal angle absent. Postgenal depression very shallow, nearly absent. Antenna extending to pronotum.

Mesosoma. Anterior margin of dorsal pronotal area in lateral view evenly rounded. Pronotal setae about as long as flagellar width or scarcely longer. Propodeal disc laterally coarsely striate; metapleural carinae complete. Fore femur only moderately expanded, more than twice as long as wide, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Highly polished, without a trace of microsculpture. Sixth sternum evenly covered with short, anteriorly-directed setae.

Color. Body entirely dark brown to black, clypeus sometimes orange to yellow. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible reddish brown. Legs yellowish brown.

Wings. Membrane tinged with yellow. Basal cells of fore wing densely and conspicuously setose.

Measurements. LFW 1.76 mm; LM 0.92 mm; WH/LH 0.78; DH/LH 0.53; EV/HE 1.17; EV/WF 0.86; WF/HE 1.36; WH/WF 1.63; OOL/WOT 2.00; DM/LM 0.42; FL/FW 2.33; HFL/HFW 2.70; A3 L/W 1.00.

Type Material. Holotype ♀ of *Sierola sima*. Hawai‘i: Kīlauea, 4,000 ft [1,220 m], taken at the lumber camp, 19 Jul 1918, W.M. Giffard, BPBMENT 000000009.

Holotype ♀ of *Sierola notabilis*. Hawai‘i: Kīlauea, 4,000 ft [1,220 m], marked “No. 7”, 7 Jun 1908, W.M. Giffard, BPBMENT 0000000008.

Material examined: 1♀, Kīlauea, Jul 1895, R.C.L. Perkins, BPBM. 1♀, Kīlauea, 691, Jul 1895, R.C.L. Perkins, USNM. 1♀, Kīlauea, Aug 1895, R.C.L. Perkins, BPBM. 1♀, Kīlauea, Sep 1895, R.C.L. Perkins, NHMUK 013380250 [left specimen on card]. 1♀, Kīlauea, Jul 1896, R.C.L. Perkins, BPBM. 3♀, Kīlauea, 4,000 ft [1,220 m], Aug 1896, A. Koebele, BPBM. 15♀, Kīlauea, Aug 1896, R.C.L. Perkins, BPBM. 1♀, Kīlauea, 656, Aug 1896, R.C.L. Perkins, USNM. 1♀, Kīlauea, 686, Aug 1896, R.C.L. Perkins, USNM. 2♀, Kīlauea, Jul 1906, R.C.L. Perkins, BPBM. 1♀, Kīlauea, 4,000 ft [1,220 m], marked "Box 4", May 1910, W.M. Giffard, BPBM (paratype). 1♀, Kīpuka Puaulu, 28 Sep 1913, [no collector], BPBM. 1♀, Pahala, 21 May 1915, [no collector], BPBM. 2♀, Kīlauea, 4,000 ft [1,220 m], in the dry forest, marked "No. 4", 11 Jan 1917, W.M. Giffard, BPBM (paratypes of *S. notabilis*). 5♀, Kīlauea, Dodonaea, 27 Jun 1917, O.H. Swezey, BPBM. 1♀, Kīlauea, 27 Jun 1917, O.H. Swezey, BPBM. 6♀, Kīlauea, Koa, 27 Jun 1917, O.H. Swezey, BPBM. 1♀, Kealakekua, 5000–5,300 ft [1520–1,620 m], on ʻōhiʻa lehua, 19 Jul 1919, P.H. Timberlake, UCRC. 1♀, Kealakekua, 3,500 ft [1,070 m], on ʻōhiʻa lehua, 11 Aug 1919, P.H. Timberlake, UCRC. 1♀, S. Kona, 11 Aug 1919, O.H. Swezey, BPBM. 1♀, Kealakekua, 3,500 ft [1,070 m], on *Pisonia inermis* [= *P. brunoniana*], 16 Aug 1919, P.H. Timberlake, UCRC. 3♀, Kealakekua, 3,500 ft [1,070 m], on *Clermontia coerulea* [= *C. clermontioides*], 16 Aug 1919, P.H. Timberlake, UCRC. 1♀, S. Kona, 16 Aug 1919, O.H. Swezey, BPBM. 1♀, Kīlauea, old crack, 4,000 ft [1,220 m], 8 Sep 1919, W.M. Giffard, HDOA. 1♀, Kīlauea, koa, 13 Sep 1925, O.H. Swezey, BPBM. 1♀, Kīlauea, ʻŌhiʻa Lehua, 11 Oct 1929, O.H. Swezey, BPBM. 10♀, Kīlauea, Kīpuka Puaulu, 26 Jun 1934, O.H. Swezey, BPBM. 6♀, same data, ex *Osmanthus* [= *Nestegis*], BPBM. 3♀, same data, ex *Suttonia* [= *Myrsine*], 28 Jun 1934, BPBM. 1♀, same data, ex *Xylosma*, 28 Jun 1934, BPBM. 2♀, same data, ex *Pipturus*, 5 Jul 1934, BPBM. 2♀, same data, ex *Coprosma*, BPBM. 3♀, same data, ex *Osmanthus*, 10 Jul 1934, BPBM. 1♀, same data, ex *Xylosma*, BPBM. 7♀ 1♂, same data, ex *Acacia koa*, 14 Jul 1934, BPBM. 1♀, Kīlauea, Puʻu ʻŌʻō trail, ex *Clermontia*, 25 Jul 1934, O.H. Swezey, BPBM. 15♀ 3♂, Kīlauea, 4 Aug 1946, E.C. Zimmerman, BPBM. 3♀, Upper Waiākea Forest Reserve, 1,280 m, clipping *Metros. polymorpha*, 24 Jun 1999, D.S. Gruner (specimens: 2-G, GRU 2623–001; 2-G, GRU 2623–003; 2-G, GRU 2623–002), BPBM. 1♀, Upper Waiākea Forest Reserve, 1,280 m, clipping *Metros. polymorpha*, 32-G, GRU 3049–001, 29 Jul 1999, D.S. Gruner, BPBM. 3♀, Upper Waiākea Forest Reserve, 1,280 m, clipping *Metros. polymorpha*, 30 Jul 1999, D.S. Gruner (specimens: 26-G, GRU 3214–001; 26-GP, GRU 3219–001; 27-GP, GRU 3248–001), BPBM. 1♀, Upper Waiākea Forest Reserve, 1,280 m, clipping *Metros. polymorpha*, 8-G, GRU 2760–002, 31 Oct 1999, D.S. Gruner, BPBM. 5♀ 4♂, Upper Waiākea Forest Reserve, 1,280 m, clipping *Metros. polymorpha*, 14 Dec 1999, D.S. Gruner (specimens: 17-GP, GRU 2991–001; 17-G, GRU 2995–004; 18-GP, GRU 3009–001; 18-G, GRU 3025–001; 18-G, GRU 3025–002; 19-G, GRU 3038–002; 19-G, GRU 3038–004; 19-GP, GRU 3059–002; 20-G, GRU 3086–001), BPBM. 3♀, Upper Waiākea Forest Reserve, 1,280 m, clipping *Metros. polymorpha*, 12 May 2000, D.S. Gruner (specimens: 21-P, GRU 3080–001; 22-G, GRU 3112–002; 22-P, GRU 3141–001), BPBM. 2♀ 1♂, Upper Waiākea Forest Reserve, 1,280 m, clipping *Metros. polymorpha*, 1 Jun 2000, D.S. Gruner (specimens: 13-G, GRU 2878–001; 15-G, GRU 2916–001; 14-G, GRU 2901–002), BPBM. 1♂, Upper Waiākea Forest Reserve, 1,280 m, clipping *Metros. polymorpha*, 13-B, GRU 7371–003, 3 May 2001, D.S. Gruner, BPBM.

Distribution. Widespread around the island in wet to mesic forest; also collected on scrub woodland on recent lava flows.

Discussion. Synonym of *S. notabilis* Fullaway, the type of which does not have the vertex concave but is otherwise identical. I have chosen *S. sima* to represent the taxon because the type of *S. notabilis* has the mandibles removed and glued separately to the point.

***Sierola sophorae* n. sp.**

Figure 99, Map 19

Island. Hawaiʻi.

Diagnosis. Part of a large complex of species with a sharp, curved to arched clypeal carina, densely setose basal wing cells, lateral ocelli distinctly separate from the vertex crest, and head deep (DH/LH ~0.59). Separated by having the frons moderately punctate with coriaceous sculpture (not strongly dull and densely punctate), and vertex and gena setae elongate. Closest to *S. compacta* Fullaway and *S. levigata* Fullaway, distinguished by the combination of head moderately narrow (WH/LH ~0.85), frons not extremely broad (WF/HE ~1.1), and fore femur moderately broad (FL/FW ~2.00).

Description. **Female**. *Head*. Clypeal process triangular, apex weakly pointed; dorsally with a sharp carina; in profile evenly curved from base to apex, apical angle slightly acute. Mandible moderately broad to moderately narrow, slightly narrowed medially and expanded at apex, ventral margin weakly concave; not twisted, at most weakly convex outwardly, outwardly coriaceous, somewhat dull; in ventral view obtusely elbowed. Apex of mandible vertical, with equally strong teeth. Malar space very small. Dorsal setae of head about as long as flagellar width or scarcely longer. Frons with shallow punctures, dense near anten-

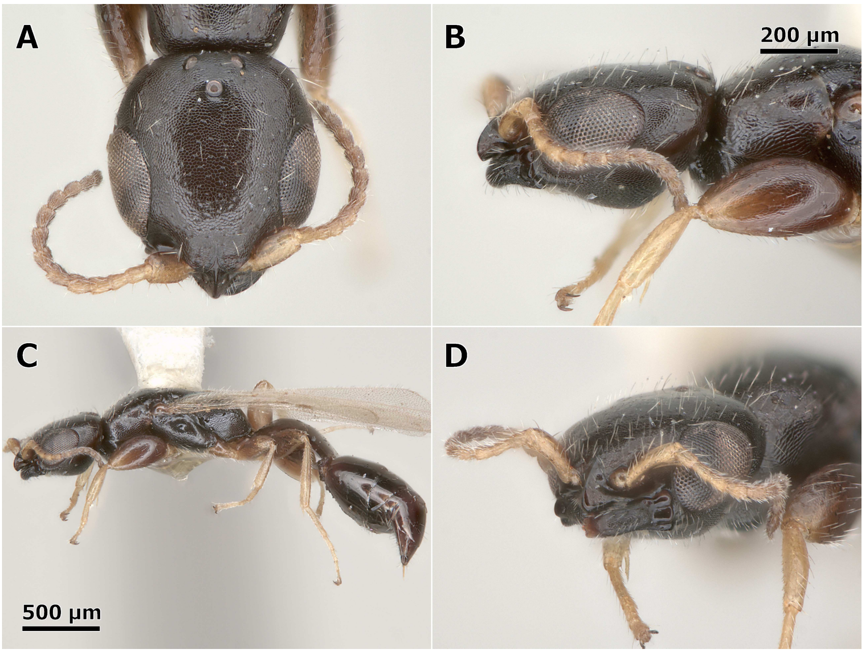


Figure 99. *Sierola sophorae*. A: head, dorsal. B: head, lateral. C: lateral habitus. D: head, frontal.

nae, 2–3 pit widths apart posterior of midpoint of eyes. Vertex and gena setae distinctly longer than frons setae but only about as thick, not particularly conspicuous. Frons microsculpture finely microreticulate, surface weakly matte to coriaceous, matte but without strong surface texture. Vertex in dorsal view more or less straight; occipital margin broadly rounded. Lateral ocelli distinctly separate from vertex crest by less than ocellus length. Ocellar triangle front angle weakly acute. Head narrowed posterior to eyes. Dorsum of head in lateral view slightly convex, head deepest on line through eye. Venter of head posterior to mandible flat in lateral view, with relatively sparse setae. Head evenly convex ventrally, genal angle absent. Side of head posterior to eye with a line of tesselate microsculpture extending from posteroventral margin of eye to vertex crest, distinctly different from smoother sculpting dorsally and ventrally. Gena ventral to eye flat. Postgenal depression shallow, rounded. Antenna extending to posterior margin of pronotum.

Mesosoma. Anterior margin of dorsal pronotal area in lateral view evenly rounded. Pronotal setae longer than flagellar width. Propodeal disc laterally coarsely striate; median carina faintly present; transverse carina faintly present, curving on each side; metapleural carinae present posteriorly, fading anteriorly. Fore femur robust, about twice as long as high and strongly convex dorsally, with both anterior and posterior surfaces convex, not strongly compressed, more or less straight in dorsal view.

Metasoma. Shining, with faint microsculpture laterally. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Body entirely dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible black. Coxae and femora brown, tibiae, tarsi, and trochanters yellow.

Wings. Membrane hyaline. Basal cells of fore wing densely and conspicuously setose. Cell 1M weakly convex posteriorly, corner posteroapical.

Measurements. LFW 1.76 mm; LM 1.02 mm; WH/LH 0.85; DH/LH 0.59; EV/HE 0.62; EV/WF 0.57; WF/HE 1.09; WH/WF 1.67; OOL/WOT 1.32; DM/LM 0.39; FL/FW 2.00; HFL/HFW 2.48; A3 L/W 1.25; 2R1 L/W 3.05.

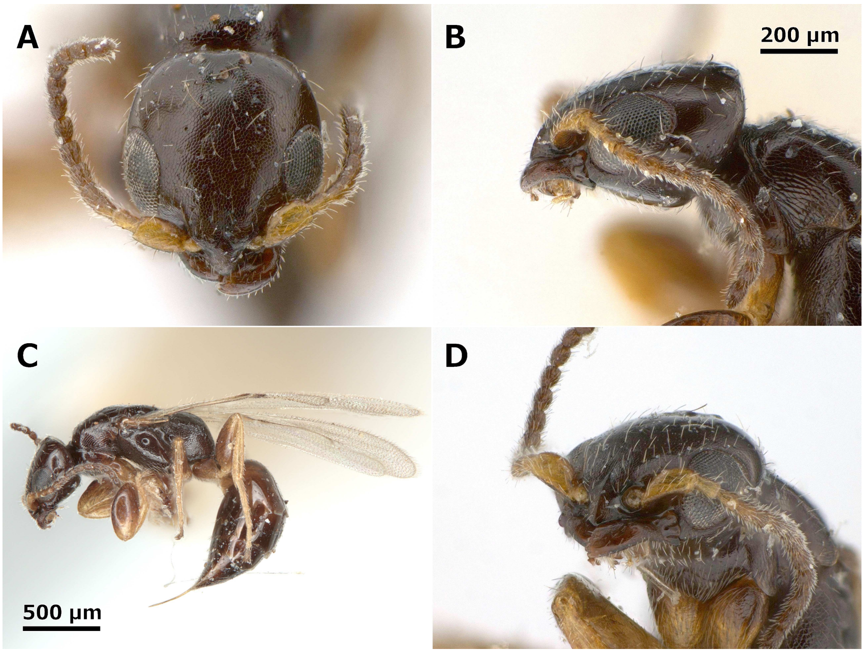


Figure 100. *Sierola streblognatha*. A: head, dorsal. B: head, lateral. C: lateral habitus. D: head, frontal.

Type Material. Holotype ♀. Hawai'i: near Humu'ula, *Sophora*, 3 Aug 1946, E.C. Zimmerman, BPBMENT 0000018132.

Etymology. Referring to the collection of the holotype on māmane (*Sophora chrysophylla*).

Distribution. Known only from the holotype, collected at the Humu'ula saddle in 1946.

Sierola streblognatha **Fullaway, 1920**
Figure 100, Map 19

Sierola streblognatha Fullaway, 1920: 104.

Island. Hawai'i.

Diagnosis. Clypeus convex dorsally and evenly curved in profile, head prominent ventrally, and basal wing cells nearly glabrous. Separated from the somewhat similar *S. pohaku* n. sp. and *S. rocki* by the black mandible and femora, and broad fore femora.

Description. **Female**. *Head*. Clypeal process rounded triangular, apex weakly pointed; dorsally rounded, convex, lacking a carina; in profile evenly curved from base to apex, apical angle slightly acute. Mandible narrowed medially and strongly expanded at apex, hourglass-shaped, ventral margin strongly concave; slightly twisted, outwardly polished, smooth, shining; in ventral view strongly elbowed. Apex of mandible vertical, with equally strong teeth. Malar space very small. Dorsal setae of head about as long as flagellar width or scarcely longer. Frons with sparse, scattered punctures, mostly 3 pit widths apart or more. Vertex and gena setae similar to and only slightly longer than setae of frons. Frons microsculpture evident but smooth, shining. Vertex in dorsal view more or less straight; occipital margin broadly rounded. Lateral ocelli nearly touching vertex crest. Ocellar triangle front angle strongly obtuse. Head rounded shortly posterior to eyes. Dorsum of head in lateral view slightly convex, head deepest on line through posterior margin of eye. Venter of

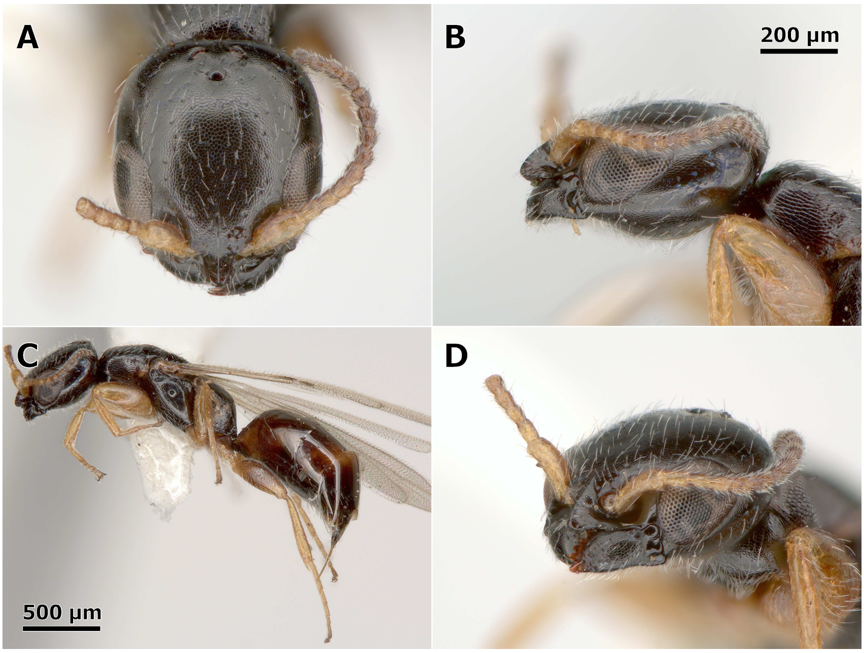


Figure 101. *Sierola uhapau*. A: head, dorsal. B: head, lateral. C: lateral habitus. D: head, frontal.

head posterior to mandible convex in lateral view, with relatively sparse setae. Genal angle prominent, apex rounded, head distinctly triangular in lateral view. Postgenal depression shallow, rounded. Antenna extending to mesonotum.

Mesosoma. Anterior margin of dorsal pronotal area in lateral view weakly angulate. Pronotal setae about as long as flagellar width or scarcely longer. Propodeal disc laterally finely, weakly striate; metapleural carinae present posteriorly, fading anteriorly. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Highly polished, without a trace of microsculpture. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Body entirely dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible black. Coxae and femora brown, tibiae, tarsi, and trochanters yellow.

Wings. Membrane tinged with yellow. Basal cells of fore wing nearly glabrous, with only few scattered setae.

Measurements. LFW 1.93 mm; LM 1.01 mm; WH/LH 0.89; DH/LH 0.62; EV/HE 0.75; EV/WF 0.60; WF/HE 1.25; WH/WF 1.68; OOL/WOT 1.31; DM/LM 0.44; FL/FW 1.88; HFL/HFW 2.52; A3 L/W 1.13.

Type Material. Holotype ♀. Hawai‘i: Pu‘u Wa‘awa‘a, 3,700 ft [1,130 m], Aug 1917, W.M. Giffard, BPBMENT 0000000065.

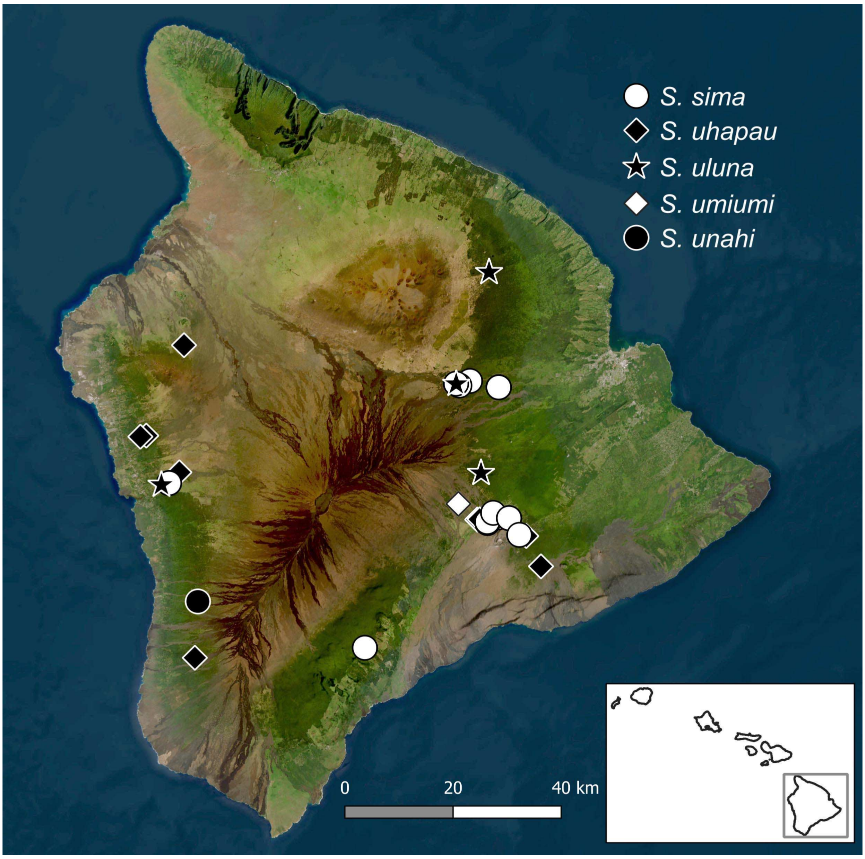
Distribution. Known only from the holotype, from Pu‘u Wa‘awa‘a.

***Sierola uhapau* n. sp.**

Figure 101, Map 20

Island. Hawai‘i.

Diagnosis. Belonging to the species group with broad, more or less parallel-sided mandible and a sharp clypeal carina that is evenly sloping or weakly curved in profile. Differing



Map 20. Collection localities of *Sierola sima*, *S. uhapau*, *S. uluna*, *S. umiumi*, and *S. unahi*.

from *S. atra* Fullaway by having the head narrower and longer behind the eye (WH/LH 0.80–0.84, DH/LH 0.53–0.57, and longer behind the eyes, OOL/WOT 1.95–2.25) and frons finely microreticulate. Closest to *S. blackburni* Fullaway, separated by the very narrow femora (FL/FW 2.25–2.45, HFL/HFW 2.55–2.90) which are predominantly yellow except for the brown hind femur, and the broad frons (WF/HE 1.25–1.40). Shares the unusual leg coloration with *S. celeris* Fullaway of O‘ahu, differing in the broader head (WH/LH 0.80–0.84 vs. 0.75–0.80 in *S. celeris*) and presence of a faint transverse carina on the propodeum.

Description. **Female**. *Head*. Clypeal process rounded triangular to semicircular, apex rounded; dorsally with a sharp carina; in profile evenly sloping, nearly straight, or evenly curved from base to apex, apical angle slightly acute. Mandible broad, not narrowed from base, ventral margin nearly straight; slightly twisted, outwardly coriaceous, somewhat dull; in ventral view obtusely elbowed. Apex of mandible vertical, with teeth distinctly stronger ventrally. Malar space almost absent. Dorsal setae of head about as long as flagellar width or scarcely longer. Frons moderately punctate, about 2–3 pit widths apart. Vertex and gena setae similar to and only slightly longer than setae of frons. Frons microsculpture finely microreticulate, surface weakly matte. Vertex in dorsal view more or less straight; occipital margin broadly rounded. Lateral ocelli separated from vertex crest by about their own length. Ocellar triangle front angle strongly acute. Head more or less parallel-sided for some distance posterior to eyes. Dorsum of head in lateral view slightly convex, head deepest on line through posterior margin of eye. Venter of head posterior to mandible convex in lateral view, with relatively sparse setae. Head evenly convex ventrally, genal angle absent. Postgenal depression absent. Antenna extending to pronotum.

Mesosoma. Anterior margin of dorsal pronotal area in lateral view weakly angulate. Pronotal setae longer than flagellar width. Propodeal disc laterally coarsely striate; transverse carina faintly present, curving on each side; metapleural carinae complete. Fore femur only moderately expanded, more than twice as long as wide, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with faint microsculpture laterally (sometimes with very faint microreticulation on T3–5). Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Body entirely dark brown to black. Antenna dark brown dorsally, yellowish brown ventrally. Mandible black. Coxae and hind femur brown, other femora brown dorsally, legs otherwise yellow.

Wings. Membrane hyaline. Basal cells of fore wing densely and conspicuously setose, or with intermediate setation, each with two complete rows and a few additional setae. Cell 1M weakly convex posteriorly, corner posteroapical.

Measurements. LFW 2.27 mm; LM 1.10 mm; WH/LH 0.84 (0.80–0.84); DH/LH 0.56 (0.55–0.57); EV/HE 0.97 (0.89–1.10); EV/WF 0.77 (0.69–0.85); WF/HE 1.26 (1.23–1.40); WH/WF 1.65 (1.55–1.66); OOL/WOT 1.95 (1.94–2.25); DM/LM 0.40; FL/FW 2.33 (2.24–2.46); HFL/HFW 2.74 (2.57–2.91); A3 L/W 1.23 (1.00–1.37); 2R1 L/W 3.05. N = 16.

Type Material. Holotype ♀. Hawai‘i: Mt Hualālai, 3,000 ft [900 m], 27 Jun 1966, C.M. Yoshimoto, BPBMENT 0000018133. Paratypes: 1♀, Kīlauea, old crack, 4,000 ft [1,220 m], 8 Sep 1919, W.M. Giffard, HDOA. 1♀, Kīlauea, 4,000 ft [1,220 m], ‘Iliahi + Naio, 20 Jul 1920, W.M. Giffard, HDOA. 1♀, Kīlauea, 4,000 ft [1,220 m], 2 Aug 1920, W.M. Giffard, HDOA. 1♀, Kīlauea Iki trail, ex *Vaccinium*, 8 Jul 1934, O.H. Swezey, BPBM. 1♀, Kīlauea, Dec 1950, N.L.H. Krauss, BPBM. 1♀, Kīpuka Kī, sweeping, 5 Aug 1960, D.E. Hardy, BPBM. 1♀, ‘Ālo‘i Crater, nr. Chain of Craters Rd, 3,000 ft [900 m], 23 Jun 1966, J.W. Beardsley, BPBM. 2♀, Kīlauea Iki Rim Trail, 3,800 ft [1,160 m], 23 Jun 1966, J.W. Beardsley, BPBM. 1♀, Pu‘u Hualālai, 900–1,200 m, 27–28 Jun 1966, J.W. Beardsley, BPBM. 1♀, Mt Hualālai, 2,500 ft [760 m], 28 Jun 1966, J.W. Beardsley, BPBM. Mauna Loa Strip Road, 4,300 ft [1,300 m], D-Vac sample ex *Acacia koa*, J. Leeper, BPBM: 2♀, 19 Jul 1971; 2♀, 4 Jan 1972; 2♀, 9 Oct 1972. Mauna Loa Strip Road, 4,300 ft [1,300 m], *Acacia koa*, J.W. Beardsley, BPBM: 1♀, 5 Jan 1973; 2♀, 11 Feb 1973. Mauna Loa Strip Road, 5,300 ft [1,620 m], D-Vac sample ex *Acacia koa*, J. Leeper, BPBM: 1♀, 13 Oct 1973, 2♀, 13 Dec 1973. 1♀, Hawaii Volcanoes National Park, Thurston, 1,175 m, fogging *Metros. polymorpha*, GRU scratch, 23 Oct 1996, D.S. Gruner & D.A. Polhemus, BPBM. 2♀, Kīpuka Kī, yellow sticky card, site #22, card B, 29 May 2004, BPBM. 2♀, Pāpā mid road, 1,230 m, 19.2118°N 155.8169°W, Townes Malaise trap, 4 Aug 2022, K.N. Magnacca, BPBM.

Etymology. From the Hawaiian *‘ūhā*, thigh, + *pa‘u*, sooty, referring to the darkened hind femur.

Distribution. Mostly found in the vicinity of Kīlauea in wet to mesic forest, with three collections from Hualālai.

Discussion. This species was initially confused with *S. blackburni*, but the coloration of the legs is very consistent and correlated with the head shape.

Sierola uluna n. sp.

Figure 102, Map 20

Island. Hawai‘i.

Diagnosis. Among species with a sharp clypeal carina and sparsely setose basal wing cells, easily recognized by the very broad head, as wide or wider than long. Similar in general appearance to *S. kauensis* Fullaway, including the very broad fore femur, but differing in the sparsely setose wing cells, lacking a distinct genal angle or postgenal depression, vertex and gena setae undifferentiated from those of the frons, and the lateral ocelli distinctly separated from the vertex crest. Nearly identical to *S. mahui* n. sp., separated by the very broad fore femur, clypeus evenly curved in profile, and metasoma mostly polished.

Description. **Female**. *Head*. Clypeal process semicircular, apex rounded; dorsally with a sharp carina; in profile evenly curved from base to apex, apical angle slightly acute. Mandible moderately broad, distinctly narrowed medially and expanded at apex, ventral margin concave; apical half of mandible strongly convex outwardly, teeth arrayed on frontal and dorsal surfaces, outwardly shining but with distinct, fine microsculpture; in ventral view

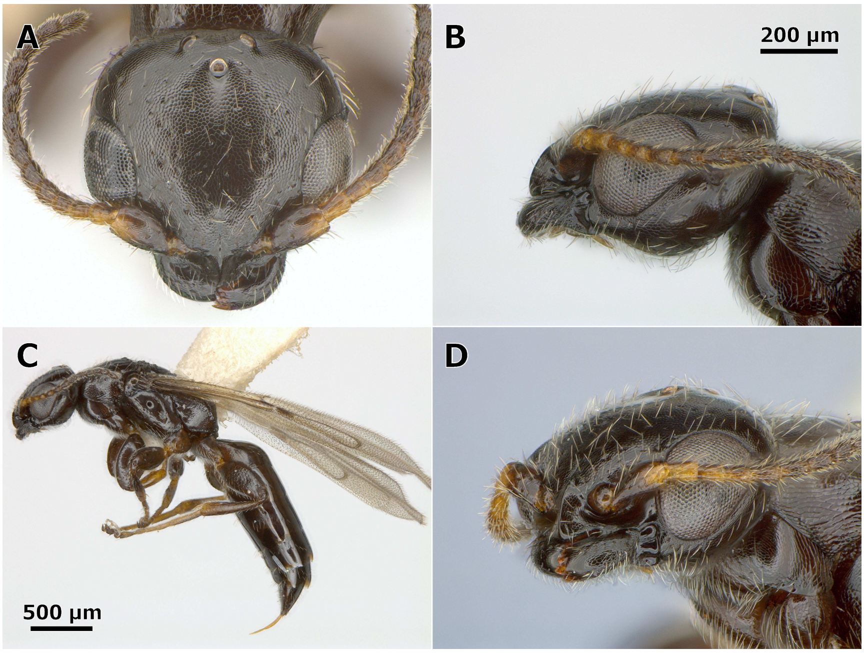


Figure 102. *Sierola uluna*. A: head, dorsal. B: head, lateral. C: lateral habitus. D: head, frontal.

evenly, moderately curved. Apex of mandible vertical, with teeth distinctly stronger ventrally. Malar space very small. Dorsal setae of head about as long as flagellar width or scarcely longer. Frons with shallow, uneven punctures, 1–3 pit widths apart. Vertex and gena setae similar to and only slightly longer than setae of frons. Frons microsculpture finely microreticulate, surface weakly matte. Vertex in dorsal view more or less straight; occipital margin broadly rounded. Lateral ocelli distinctly separate from vertex crest by less than ocellus length. Ocellar triangle front angle weakly acute. Head rounded shortly posterior to eyes. Dorsum of head in lateral view strongly convex, head deepest on line through eye. Venter of head posterior to mandible convex in lateral view, with moderately dense pubescence. Head strongly convex ventrally, genal angle absent. Postgenal depression very shallow, nearly absent. Antenna extending to mesonotum.

Mesosoma. Anterior margin of dorsal pronotal area in lateral view evenly rounded. Pronotal setae longer than flagellar width. Propodeal disc laterally finely, weakly striate; metapleural carinae complete. Fore femur strongly expanded, less than twice as long as wide, with both anterior and posterior surfaces convex, not strongly compressed, more or less straight in dorsal view.

Metasoma. Shining, with faint microsculpture laterally. Sixth sternum narrowly glabrous medially, laterally with dense pilose setae.

Color. Body entirely dark brown to black. Antenna entirely dark brown except ventral side of basal segments yellowish. Mandible black. Legs all dark brown to black.

Wings. Membrane tinged with yellow. Basal cells of fore wing sparsely setose, with one or two rows of setae in each cell. Cell 1M weakly convex posteriorly, corner posteroapical.

Measurements. LFW 2.69 mm; LM 1.24 mm; WH/LH 1.04 (1.00–1.05); DH/LH 0.65 (0.63–0.65); EV/HE 0.52 (0.50–0.63); EV/WF 0.38 (0.38–0.48); WF/HE 1.36 (1.24–1.36); WH/WF 1.66 (1.63–1.71); OOL/WOT 1.33 (1.20–1.33); DM/LM 0.44; FL/FW 1.74 (1.70–1.77); HFL/HFW 2.03 (1.97–2.08); A3 L/W 1.34 (1.23–1.34); 2R1 L/W 3.04. N = 5.

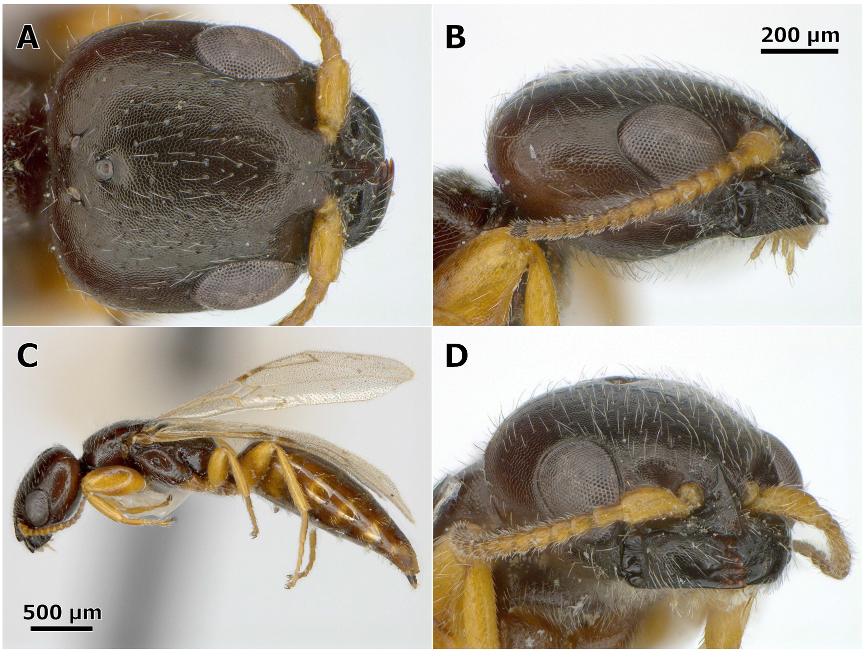


Figure 103. *Sierola umiumi*. A: head, dorsal. B: head, lateral. C: lateral habitus. D: head, frontal.

Type Material. Holotype ♀. Hawai‘i: Kīlauea Forest Reserve IBP study site, 1,586 m, Malaise Trap #2, WAS #71–46, 1–8 Feb 1971, W.A. Steffan & F.G. Howarth, BPBMENT 0000018134. Paratypes: 1♀, Ka‘ū Road, 16 Jan 1917, F. Muir, BPBM. 1♀, S. Kona, ‘Ōhi‘a, 8 Aug 1919, O.H. Swezey, BPBM. 2♀, Kealakekua, 3,000 ft [910 m], on ‘ōhi‘a lehua, 8 Aug 1919, P.H. Timberlake, UCRC ENT 556760, 556761. 1♀, Kona, 27 Jul 1921, O.H. Swezey & F.X. Williams, BPBM. 1♀, Nauhi Gulch, 5,000–6,000 ft [1,520–1,830 m], ‘Ōhi‘a Lehua, 2 Oct 1931, O.H. Swezey & F.X. Williams, BPBM. 1♀, Upper Waiākea FR, kīpuka 6, 1647 m, 19.6697°N 155.3582°W, ‘ōhi‘a canopy branch clipping, collection K6-TR2–2009, lot HI-0936, 15 Jul 2009, D. Leopold & B. Hwang, BPBM.

Etymology. From the Hawaiian *uluna*, upper arm, referring to the strongly swollen femora.

Distribution. Rare, known from only eight specimens, but found across the island in mesic to wet forest and collected recently.

Sierola umiumi n. sp.

Figure 103, Map 20

Island. Hawai‘i.

Diagnosis. Belonging to the species group with broad, more or less parallel-sided mandible and a sharp clypeal carina that is evenly sloping or weakly curved in profile. Readily separated from similar species by the dense, downy ventral pubescence of the head. The head is also both broad and deep, and long behind the eyes. Closest to *S. testaceipes* Cameron of O‘ahu, distinguished by the distinctly broader head and longer antenna (A3 longer than wide).

Description. **Female**. *Head*. Clypeal process semicircular, apex rounded; dorsally with a sharp carina; in profile evenly sloping, nearly straight. Mandible broad, not narrowed from base, ventral margin nearly straight; slightly twisted, outwardly coriaceous, somewhat dull; in ventral view obtusely elbowed. Apex of mandible vertical, with teeth distinctly stronger ventrally. Malar space very small. Dorsal setae of head distinctly longer than flagellar width. Frons with relatively regular, moderately close punctures, 1–2 pit widths apart.

Vertex and gena setae similar to and only slightly longer than setae of frons. Frons microsculpture coriaceous, matte but without strong surface texture. Vertex in dorsal view very slightly concave; occipital margin broadly rounded. Lateral ocelli separated from vertex crest by greater than their length. Ocellar triangle front angle strongly acute. Head more or less parallel-sided for some distance posterior to eyes. Dorsum of head in lateral view slightly convex, head deepest on line through posterior margin of eye. Venter of head posterior to mandible convex in lateral view, with dense, downy pubescence, conspicuous in lateral view and extending past the genal angle. Head evenly convex ventrally, genal angle absent. Postgenal depression absent. Antenna extending to anterior margin of pronotum.

Mesosoma. Anterior margin of dorsal pronotal area in lateral view evenly rounded. Pronotal setae longer than flagellar width. Propodeal disc laterally finely, weakly striate; metapleural carinae complete. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with very faint microreticulation over posterior terga. Sixth sternum broadly glabrous medially, with sparse setae laterally.

Color. Head and mesosoma black, metasoma brownish. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible black. Hind coxa and femur brown except at apices, fore and mid femora tinged with brown dorsally, legs otherwise yellow.

Wings. Membrane hyaline. Basal cells of fore wing sparsely setose, with one or two rows of setae in each cell. Cell 1M weakly convex posteriorly, corner posteroapical.

Measurements. LFW 2.58 mm; LM 1.20 mm; WH/LH 0.87; DH/LH 0.58; EV/HE 1.14; EV/WF 0.75; WF/HE 1.52; WH/WF 1.63; OOL/WOT 2.03; DM/LM 0.44; FL/FW 2.06; HFL/HFW 2.35; A3 L/W 1.33; 2R1 L/W 2.75.

Type Material. Holotype ♀. Hawai‘i: Mauna Loa Strip Road, 5,300 ft [1,620 m], D-Vac sample ex *Acacia koa*, 1 Sep 1971, J. Leeper, BPBMENT 0000018135.

Etymology. From the Hawaiian *‘umi‘umi*, beard, referring to the setose ventral head.

Distribution. Known only from the unique holotype, collected at Hawaii Volcanoes in 1971.

***Sierola unahi* n. sp.**

Figure 104, Map 20

Island. Hawai‘i.

Diagnosis. The unusual scutellate sculpture of the frons, which obscures the punctation, together with the triangular head shape (in both dorsal and lateral views) and low, elongate clypeus readily separates this species from all others. It is also unusual in having the hind femur relatively broader than the fore femur, and the form of the clypeus, which is elongate and curved in profile. Superficially similar to *S. papio* n. sp. but differing in the narrow fore femur and form of the mandible, which is not twisted and only slightly curved in ventral view, and has conspicuous setae on the outer surface.

Description. **Female**. *Head*. Clypeal process rounded triangular, apex weakly pointed; dorsally rounded, convex, lacking a carina; in profile elongate, evenly curved, apex acute. Mandible moderately narrow at base, distinctly broader on apical half, ventral margin distinctly concave; not twisted, at most weakly convex outwardly, outwardly shining but with distinct, fine microsculpture (and conspicuously setose); in ventral view weakly curved. Apex of mandible vertical, with small, indistinct teeth. Malar space very small. Dorsal setae of head about as long as flagellar width or scarcely longer. Frons punctation obscured by microsculpture. Vertex and gena setae similar to and only slightly longer than setae of frons. Frons microsculpture minutely scutellate, cellules shining but separated by conspicuous margins. Vertex in dorsal view more or less straight; occipital margin narrowly rounded. Lateral ocelli nearly touching vertex crest. Ocellar triangle front angle weakly obtuse. Head broadening posterior to eyes. Dorsum of head in lateral view nearly flat, convex around ocellar triangle, head deepest on line well posterior of eye. Venter of head posterior to mandible flat in lateral view, with relatively sparse setae. Genal angle present posteriorly,

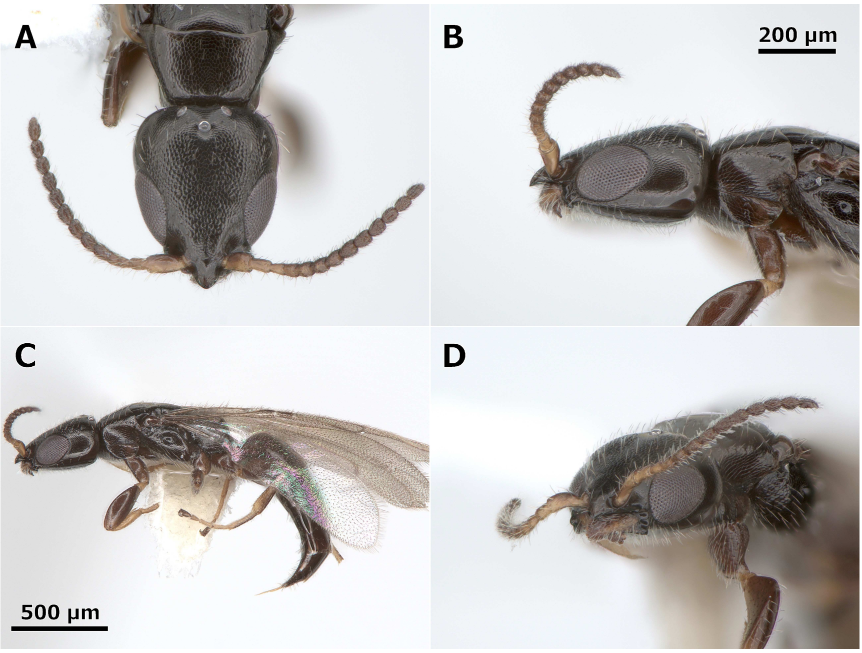


Figure 104. *Sierola unahi*. A: head, dorsal. B: head, lateral. C: lateral habitus. D: head, frontal.

not prominent, head relatively flat. Postgenal depression absent. Antenna extending to posterior margin of pronotum.

Mesosoma. Anterior margin of dorsal pronotal area in lateral view evenly rounded. Pronotal setae about as long as flagellar width or scarcely longer. Propodeal disc laterally finely, weakly striate; metapleural carinae present posteriorly, fading anteriorly. Fore femur only moderately expanded, more than twice as long as wide, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with faint microsculpture laterally. Sixth sternum broadly glabrous medially, with moderately dense setae laterally.

Color. Body entirely dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible reddish brown. Coxae and femora dark brown to black, fore tibia and tarsi yellow, mid and hind tibiae brown with yellow bands at bases and apices.

Wings. Membrane weakly infuscate. Basal cells of fore wing sparsely setose, with one or two rows of setae in each cell. Cell 1M weakly convex posteriorly, corner posteroapical.

Measurements. LFW 1.71 mm; LM 0.78 mm; WH/LH 0.79; DH/LH 0.54; EV/HE 0.77; EV/WF 0.82; WF/HE 0.93; WH/WF 1.96; OOL/WOT 1.12; DM/LM 0.40; FL/FW 2.30; HFL/HFW 2.21; A3 L/W 1.30; 2R1 L/W 3.06.

Type Material. Holotype ♀. Hawai‘i: Kukuiopa‘e, 4,900 ft [1,490 m], sweeping *Cheirodendron*, 17 Sep 2011, K.N. Magnacca, BPBMENT 0000018136.

Etymology. From the Hawaiian *unahi*, scaly, as like a fish, referring to the microsculpture of the frons.

Distribution. Known only from the holotype, collected in South Kona.

Discussion. The scutellate microsculpture of the frons is found among the Hawaiian species only in *S. hou* n. sp. and *S. mahuna* n. sp., both of which differ in most other respects, and only known elsewhere in the genus from a handful of undescribed Australian species.

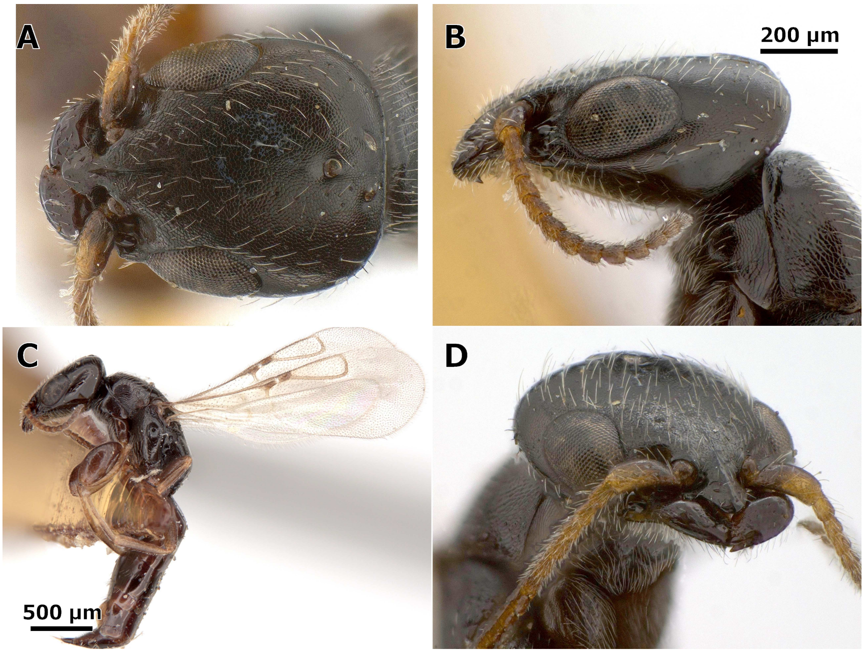


Figure 105. *Sierola volcanica*. A: head, dorsal. B: head, lateral. C: lateral habitus. D: head, frontal.

***Sierola volcanica* Fullaway, 1920**

Figure 105, Map 21

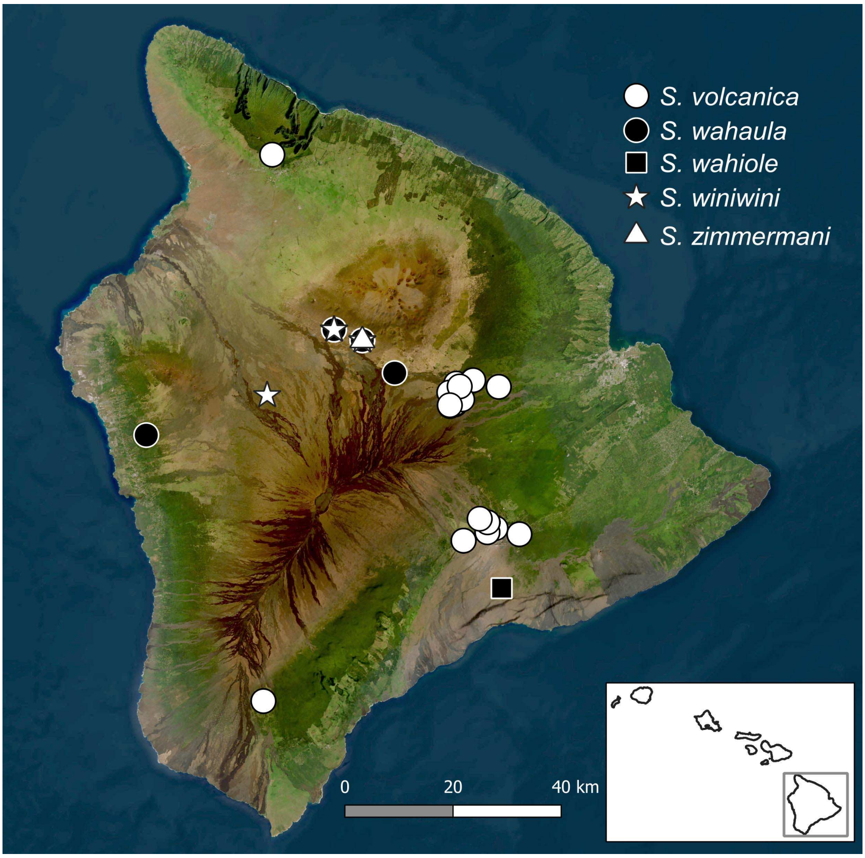
Sierola volcanica Fullaway, 1920: 74.

Island. Hawai‘i.

Diagnosis. A distinctive species, recognized by the broad, compressed head which is more or less flat or only slightly convex dorsally, convex clypeus, strongly twisted mandible, and densely setose basal wing cells. Closest to *S. konana* Fullaway, separated by the narrower, more elongate head.

Description. **Female**. *Head*. Clypeal process semicircular, apex rounded; dorsally rounded, convex, lacking a carina; in profile evenly sloping, nearly straight. Mandible broad; strongly twisted, outwardly polished, smooth, shining; in ventral view strongly elbowed. Apex of mandible vertical, with equally strong teeth. Malar space 1/3 as long as width of base of mandible. Dorsal setae of head about as long as flagellar width or scarcely longer. Frons with shallow, uneven punctures, 1–3 pit widths apart. Vertex and gena setae similar to and only slightly longer than setae of frons. Frons microsculpture finely microreticulate, surface weakly matte. Vertex in dorsal view more or less straight; occipital margin broadly rounded. Lateral ocelli distinctly separate from vertex crest by less than ocellus length. Ocellar triangle front angle weakly to strongly acute. Head more or less parallel-sided for some distance posterior to eyes. Dorsum of head in lateral view nearly flat posterior to middle of eyes, head deepest on line well posterior of eye. Venter of head posterior to mandible slightly convex to flat in lateral view, with sparse to moderately dense pubescence. Head evenly convex ventrally or with an indistinct genal angle present posteriorly, not prominent. Postgenal depression shallow, rounded. Antenna extending to anterior margin of pronotum.

Mesosoma. Anterior margin of dorsal pronotal area in lateral view weakly angulate. Pronotal setae longer than flagellar width. Propodeal disc laterally finely, weakly striate; metapleural carinae present posteriorly, fading anteriorly (rarely complete). Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.



Map 21. Collection localities of *Sierola volcanica*, *S. wahaula, S. wahiole, S. winiwini*, and *S. zimmermani.*

Metasoma. Highly polished, without a trace of microsculpture. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Body entirely dark brown to black. Antenna dark brown dorsally, yellowish brown ventrally. Mandible black. Coxae and femora dark brown to black, fore tibia and tarsi yellow, mid and hind tibiae brown with yellow bands at bases and apices.

Wings. Membrane hyaline, or tinged with yellow. Basal cells of fore wing densely and conspicuously setose. Cell 1M weakly convex posteriorly, corner posteroapical.

Measurements. LFW 2.27 mm; LM 1.13 mm; WH/LH 0.79 (0.78–0.86); DH/LH 0.46 (046–0.52); EV/HE 0.98 (0.86–1.03); EV/WF 0.75 (0.66–0.80); WF/HE 1.30 (1.27–1.41); WH/WF 1.67 (1.61–1.69); OOL/WOT 1.84 (1.64–1.91); DM/LM 0.44; FL/FW 2.00 (1.87–2.07); HFL/HFW 2.39 (2.24–2.55); A3 L/W 1.33 (1.00–1.43); 2R1 L/W 2.91. N = 14.

Type Material. Holotype ♀. Hawai‘i: Ka‘ū, 4,000 ft [1,220 m], A-a flows, 25 Jul 1918, W.M. Giffard, BPBMENT 0000000004.

Material examined: 1♀, Kīlauea, *Straussia* [= *Psychotria*], 27 Jun 1917, O.H. Swezey, BPBM. 1♀, Ka‘ū, 3,600 ft [1,100 m], A-a flows, 13 Jul 1918, W.M. Giffard, BPBM (paratype). 1♀, same data, 18 Jul 1918, BPBM (paratype). 1♀, same data, 23 Jul 1918, BPBM (paratype). 3♀, Kīlauea, 4,000 ft [1,220 m], 8 Sep 1919, W.M. Giffard, BPBM. 2♀, Kīlauea, 4,000 ft [1,220 m], on ohia, 9 Sep 1919, F.X. Williams, BPBM. 3♀, Ka‘ū Desert, Kīlauea, 3,800 ft [1,160 m], 13 Sep 1919, W.M. Giffard, BPBM. 1♀, Kīlauea, 4,000 ft [1,220 m], ‘iliahi [*Santalum*] + naio [*Myoporum*], 20 Jul 1920, W.M. Giffard, BPBM. 1♀, Ka‘ū Desert, Kīlauea, 3,800 ft [1,160 m], *Cyathodes* [= *Sadleria*] + ‘ōhi‘a, 22 Jul 1920, W.M. Giffard, BPBM. 1♀, Kīlauea, 4,000 ft [1,220 m], 2 Aug 1920, W.M. Giffard, BPBM. 1♀, same data, 18 Aug 1920, BPBM. 1♀, Ka‘ū Desert, Kīlauea, 3,800 ft [1,160 m], 10 Sep 1920, W.M. Giffard, HDOA. 1♀, Kīlauea-Ka‘ū, 4,000 ft [1,220 m], 22 Jun 1966, J.W. Beardsley, BPBM. 2♀, Kīlauea Iki Rim Trail, 3,800 ft [1,160 m], 23 Jun 1966, J.W. Beardsley, BPBM. 1♀, rim of Kīlauea Iki Crater, 3,800 ft [1,160 m], 23 Jun 1966, J.W. Beardsley, BPBM. 2♀, Kohala Forest Reserve, 1,158 m, fogging *Metros. polymorpha*, 12 Oct 1997, D.S. Gruner & D.A. Polhemus (specimens: 7–3, GRU 0667–003; 7–3, GRU 0667–008), BPBM. 1♀, same data, 8–2, GRU 0683–001, 14 Oct 1997, BPBM. 1♀, Upper Waiākea Forest Reserve, 1,280 m, clipping *Metros. polymorpha*, 25-G, GRU 3208–001, 30 Jul 1999, D.S. Gruner, BPBM. 1♀, same data, 26-B, GRU 7602–001, 17 Apr 2001, BPBM. 2♀, same data, (specimens: 1-A, GRU 7003–002; 1-C, GRU 7023–001), 25 Apr 2001, D.S. Gruner, BPBM. 1♀, same data, 32-B, GRU 7353–002, 2 May 2001, BPBM. 1♀, same data, 13-A, GRU 7746–001, 3 May 2001, BPBM. 1♀, Kīpuka Kī, yellow sticky card, site #14, card G, 2 May 2003, BPBM. 3♀, Kahuku Ranch, yellow sticky card, 23 Feb 2007, BPBM. 18♀, Upper Waiākea FR, various kīpuka, 1495–1782 m, ‘ōhi‘a canopy branch clipping, 7 Jul 2009–14 Jul 2010, D. Leopold & B. Hwang, UMD.

Distribution. Moderately common, known from a relatively large series collected at Kīlauea between 1917 and 1920, and numerous fogging samples scattered on the windward side.

Discussion. This species appears to occur in two morphotypes depending on the habitat. In wet forest, the head is slightly broader and deeper (WH/LH 0.82–0.86, DH/LH 0.49–0.52), distinctly rounded ventrally, and deepest beneath the hind margin of the eye; in dry areas, the head is narrower and more compressed (WH/LH 0.78–0.82, DH/LH 0.46–0.48), flat behind the mandible to a distinct genal angle, and deepest behind the eye. The proportions are within the range of variation seen in other species, cannot be unambiguously distinguished, and other than these characters there does not appear to be anything to separate them. It seems best to keep them together; they may be ecomorphs in the process of speciation. The wet forest form grades into *S. konana*.

***Sierola wahaula* n. sp.**

Figure 106, Map 21

Island. Hawai‘i.

Diagnosis. Easily recognized by the broad head which is widest posterior of the eyes and narrowest near the anterior margin of the eyes, clypeus recurved in profile, and moderately broad mandible which is usually reddish brown. Very similar to *S. huna* n. sp., differing in having conspicuously long (though sparse) frons setae and the mandible parallel-sided.

Description. **Female**. *Head*. Clypeal process semi-elliptical, apex rounded; dorsally with a sharp carina, or with a rounded carina; in profile weakly sloping dorsally but strongly rounded and recurved at apex. Mandible moderately broad, slightly narrowed medially and expanded at apex, ventral margin weakly concave; apical half of mandible strongly convex outwardly, teeth arrayed on frontal and dorsal surfaces, outwardly coriaceous, somewhat dull; in ventral view evenly, moderately curved. Apex of mandible vertical, with teeth distinctly stronger ventrally. Malar space very small. Dorsal setae of head about twice as long as flagellar width or more. Frons moderately punctate, about 2–3 pit widths apart. Vertex and gena setae distinctly longer than frons setae but only about as thick, not particularly conspicuous. Frons microsculpture finely microreticulate, surface weakly matte, or evident but smooth, shining. Vertex in dorsal view very slightly concave; occipital margin broadly rounded. Lateral ocelli distinctly separate from vertex crest by less than ocellus length. Ocellar triangle front angle weakly acute. Head broadening posterior to eyes. Dorsum of head in lateral view slightly convex, head deepest on line through posterior margin of eye. Venter of head posterior to mandible convex in lateral view, with relatively sparse setae. Head weakly convex ventrally, genal angle absent. Postgenal depression very shallow, nearly absent. Antenna extending to anterior margin of pronotum.

Mesosoma. Anterior margin of dorsal pronotal area in lateral view evenly rounded. Pronotal setae elongate, twice as long as flagellar width or more. Propodeal disc laterally shining, with weak microsculpture; metapleural carinae complete. Fore femur only moder-

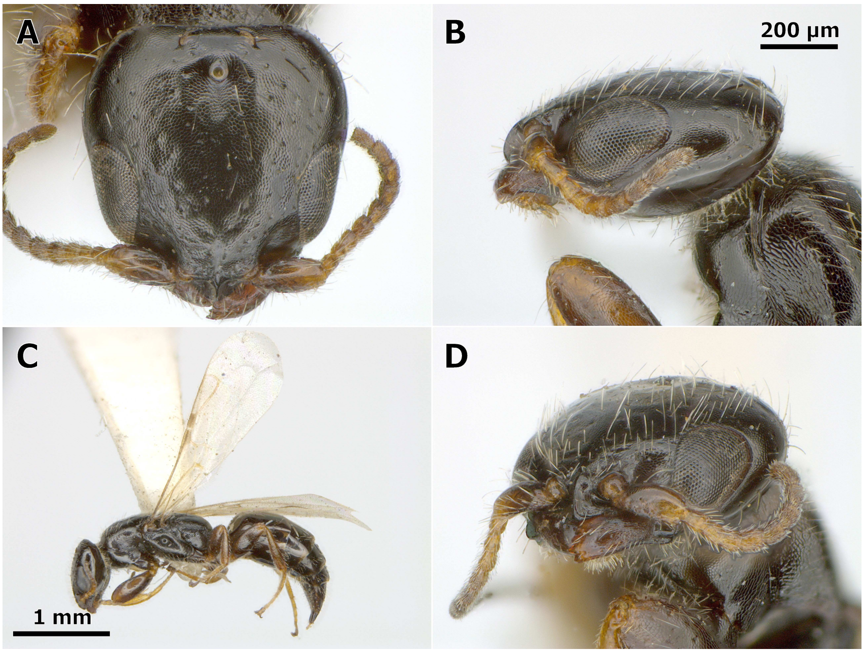


Figure 106. *Sierola wahaula*. A: head, dorsal. B: head, lateral. C: lateral habitus. D: head, frontal.

ately expanded, more than twice as long as wide, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with faint microsculpture laterally. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Body entirely dark brown to black. Antenna brown on base of scape and apical flagellar segments, yellow medially. Mandible black to orange. Coxae and femora dark brown to black, tibiae, tarsi, and trochanters yellow or fore tibia and tarsi yellow, mid and hind tibiae brown with yellow bands at bases and apices.

Wings. Membrane hyaline. Basal cells of fore wing sparsely setose, cell R somewhat densely setose apically. Cell 1M weakly convex posteriorly, corner posteroapical.

Measurements. LFW 2.27 mm; LM 1.17 mm; WH/LH 0.92 (0.89–0.95); DH/LH 0.54 (0.51–0.54); EV/HE 1.00 (0.97–1.00); EV/WF 0.71 (0.70–0.72); WF/HE 1.41 (1.34–1.44); WH/WF 1.69 (1.69–1.70); OOL/WOT 1.52 (1.52–1.71); DM/LM 0.40; FL/FW 2.21 (2.06–2.27); HFL/HFW 2.32 (2.32–2.48); A3 L/W 1.37 (1.00–1.37); 2R1 L/W 3.06. N = 5.

Type Material. Holotype ♀. Hawai‘i: Pōhakuloa, 1,800 m, 25 Jun 1966, J.W. Beardsley, BPBMENT 0000018137. Paratypes: 1♀, Humu‘ula, *Myoporum*, 31 Jul 1935, R.L. Usinger, BPBM. 1♀, Humu‘ula, Pōhakuloa, *Myoporum*, 31 Jul 1936, E.H. Bryan, BPBM. 2♀, near Humu‘ula, *Myoporum*, 7 Aug 1946, E.C. Zimmerman, BPBM. 1♀, Pōhakuloa, 21 Jun 1966, J.W. Beardsley, BPBM. 2♀, Pōhakuloa, 1,800 m, 25 Jun 1966, J.W. Beardsley, BPBM. 1♀, Mt Hualālai, 27 Jun 1966, C.M. Yoshimoto, BPBM. 1♀, Pōhakuloa, 3,800 ft [1,160 m; this is an error], 29 Jun 1966, J.W. Beardsley, BPBM.

Etymology. From the Hawaiian *waha ‘ula*, red mouth, referring to the mandibles. It is also the name of a large heiau on Hawai‘i, which was covered by lava in 1997.

Distribution. Restricted to the Pōhakuloa–Humu‘ula saddle region between Mauna Kea and Mauna Loa. Known from 10 specimens, last collected in 1966.

Discussion. Although the intermediate states of the clypeal carina, mandible color, and basal wing cell setation cause this species to come out in multiple places in the key, it is very distinctive not only on the island of Hawai‘i but among the known *Sierola* species. See notes under *S. huna*.

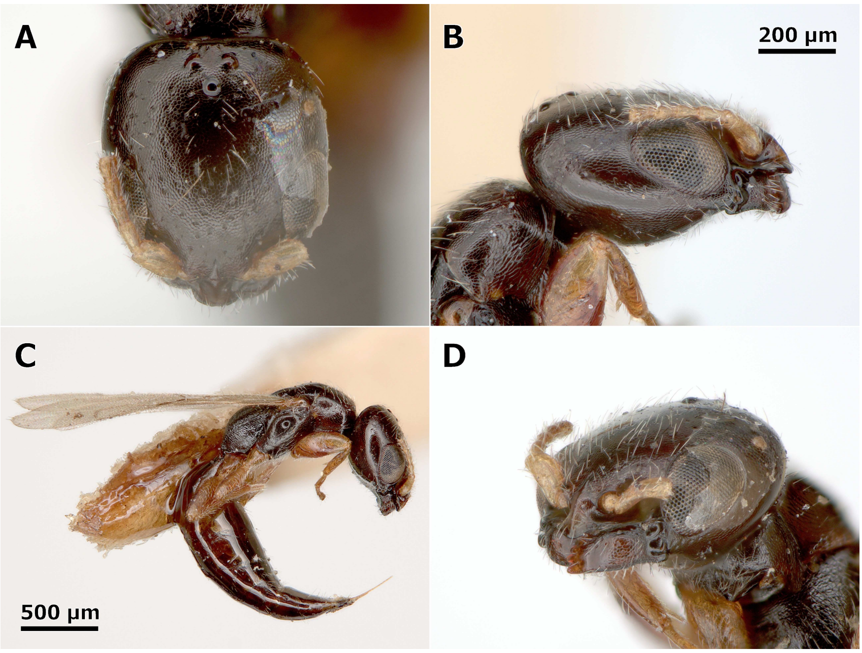


Figure 107. *Sierola wahiole*. A: head, dorsal. B: head, lateral. C: lateral habitus. D: head, frontal.

***Sierola wahiole* n. sp.**

Figure 107, Map 21

Island. Hawai‘i.

Diagnosis. Distinguished by the weakly carinate, evenly curved clypeus, broad black mandible, and ocellar triangle strongly acute with the lateral ocelli separated from the vertex. Related to *S. malino* Magnacca of O‘ahu, separated by lacking dense ventral setae on the head and the much greater OOL/WOT.

Description. **Female**. *Head*. Clypeal process semi-elliptical, apex broadly rounded; dorsally weakly carinate; in profile evenly curved from base to apex, apical angle slightly acute. Mandible broad, not narrowed from base, ventral margin nearly straight; slightly twisted, outwardly shining but with distinct, fine microsculpture; in ventral view obtusely elbowed. Apex of mandible slightly oblique, with teeth distinctly stronger ventrally. Malar space very small. Dorsal setae of head about as long as flagellar width or scarcely longer. Frons with distinct, uneven punctures, 1–3 pit widths apart. Vertex and gena setae similar to and only slightly longer than setae of frons. Frons microsculpture coriaceous, matte but without strong surface texture. Vertex in dorsal view very slightly concave; occipital margin broadly rounded. Lateral ocelli distinctly separate from vertex crest by about their own length or slightly less. Ocellar triangle front angle strongly acute. Head more or less parallel-sided for some distance posterior to eyes. Dorsum of head in lateral view slightly convex, head deepest on line through posterior margin of eye. Venter of head posterior to mandible convex in lateral view, with relatively sparse setae. Head evenly convex ventrally, genal angle absent. Postgenal depression shallow, rounded.

Mesosoma. Anterior margin of dorsal pronotal area in lateral view evenly rounded. Pronotal setae longer than flagellar width. Propodeal disc laterally coarsely striate; metapleural carinae complete. Fore femur only moderately expanded, more than twice as long as wide, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with faint microsculpture laterally. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Body entirely dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible black. Legs yellowish brown (may be yellow or partially brown in fresh specimens).

Wings. Membrane hyaline. Basal cells of fore wing densely and conspicuously setose. Cell 1M weakly convex posteriorly, corner posteroapical.

Measurements. LFW 2.00 mm; LM 0.98 mm; WH/LH 0.81; DH/LH 0.56; EV/HE 1.00; EV/WF 0.78; WF/HE 1.28; WH/WF 1.68; OOL/WOT 2.15; DM/LM 0.45; FL/FW 2.38; HFL/HFW 2.95; A3 L/W 1.36; 2R1 L/W 2.52.

Type Material. Holotype ♀. Hawai‘i: Hawai‘i, [no date], A. Koebele, BPBMENT 0000018138. Paratypes: 1♀, New Nēnē, yellow sticky card, site #1, card J, 30 May 2001, BPBM. 1♀, New Nēnē, yellow sticky card, site #2, card I, 2 Apr 2002, BPBM.

Etymology. From the Hawaiian *wahi*, place, + ‘*ole*, without, referring to the lack of specific locality information on the holotype.

Distribution. Known only from the holotype (with no locality) and two recent specimens from the south flank of Kīlauea.

Discussion. The legs of the holotype are reddish brown but appear to be discolored; the true color is uncertain. Neither the date nor locality of the holotype is recorded, but it must have been taken in the 1890s or early 1900s when Koebele was in Hawaii.

***Sierola winiwini* n. sp.**

Figure 108, Map 21

Island. Hawai‘i.

Diagnosis. Belonging to the group of species with the clypeus enlarged and weakly carinate or angulate dorsally. Separated from *S. aiwa* n. sp. and *S. sima* Fullaway by the elongate trapezoidal clypeus, narrow mandible, head shorter behind the eyes, and lateral ocelli separate from vertex crest by less than their diameter. Very similar to *S. papalina* n. sp. in general appearance, but the head is narrower and more compressed, mandible narrower, and the clypeus is thinner in profile and only weakly carinate.

Description. **Female**. *Head*. Clypeal process elongate trapezoidal, apex narrowly transverse; dorsally weakly carinate; in profile elongate, evenly curved, apex acute. Mandible narrow, expanded at base and apex, ventral margin distinctly concave; strongly twisted, outwardly polished and shining distal of bend, coriaceous and dull basally; in ventral view weakly curved. Apex of mandible slightly oblique, with second ventral tooth largest. Malar space very small. Dorsal setae of head about as long as flagellar width or scarcely longer. Frons moderately punctate, about 2–3 pit widths apart. Vertex and gena setae similar to and only slightly longer than setae of frons. Frons microsculpture finely microreticulate, surface weakly matte. Vertex in dorsal view more or less straight; occipital margin broadly rounded. Lateral ocelli distinctly separate from vertex crest by less than ocellus length. Ocellar triangle front angle weakly acute. Head more or less parallel-sided for some distance posterior to eyes. Dorsum of head in lateral view slightly convex, head deepest on line through posterior margin of eye. Venter of head posterior to mandible flat in lateral view, with relatively sparse setae. Head evenly convex ventrally, genal angle absent. Postgenal depression very shallow, nearly absent. Antenna extending to pronotum.

Mesosoma. Anterior margin of dorsal pronotal area in lateral view evenly rounded. Pronotal setae longer than flagellar width. Propodeal disc laterally coarsely striate; median carina faintly present; transverse carina faintly present; metapleural carinae complete. Fore femur only moderately expanded, more than twice as long as wide, with both anterior and posterior surfaces convex, not strongly compressed, more or less straight in dorsal view.

Metasoma. Highly polished, without a trace of microsculpture. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

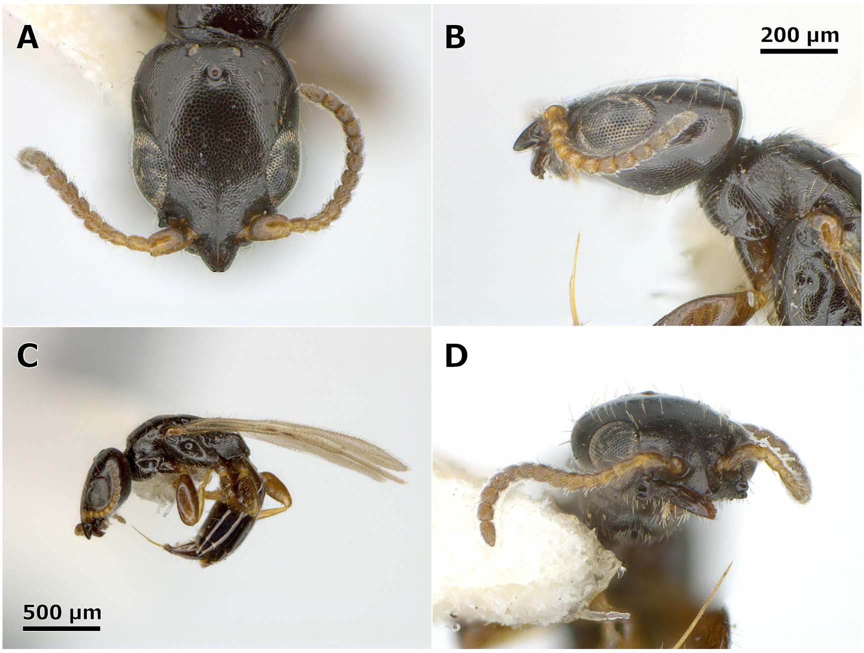


Figure 108. *Sierola winiwini*. A: head, dorsal. B: head, lateral. C: lateral habitus. D: head, frontal.

Color. Body entirely dark brown to black. Antenna entirely dark brown to black. Mandible black (rarely reddish brown). Coxae and femora dark brown to black, fore tibia and tarsi yellow, mid and hind tibiae brown with yellow bands at bases and apices.

Wings. Membrane hyaline. Basal cells of fore wing sparsely setose, with one or two rows of setae in each cell, or nearly glabrous, with only a few scattered setae.

Measurements. LFW 1.61 mm; LM 0.80 mm; WH/LH 0.72; DH/LH 0.50; EV/HE 0.91; EV/WF 0.85; WF/HE 1.06; WH/WF 1.79; OOL/WOT 1.45; DM/LM 0.40; FL/FW 2.18; HFL/HFW 2.56; A3 L/W 1.20; 2R1 L/W 3.01.

Type Material. Holotype ♀. Hawai‘i: Pōhakuloa, 1,800 m, 25 Jun 1966, J.W. Beardsley, BPBMENT 0000018139.

Paratypes: 1♀, near Humu‘ula, *Sophora*, 3 Aug 1946, E.C. Zimmerman, BPBM. 4♀, same data, 7 Aug 1946, BPBM. 1♀, near Humu‘ula, *Myoporum*, 7 Aug 1946, E.C. Zimmerman, BPBM. 2♀, Pōhakuloa, 21 Jun 1966, J.W. Beardsley, BPBM. 1♀, Pōhakuloa, on *Chenopodium*, 21 Jun 1966, J.W. Beardsley, BPBM. 3♀, Pōhakuloa, 1,800 m, 25 Jun 1966, J.W. Beardsley, BPBM. 2♀, Pōhakuloa, 6,000 ft [1,830 m], ex *Chenopodium oahuense*, 9 Jun 1986, J.W. Beardsley, BPBM. 1♀, Pōhakuloa Training Area, Kīpuka ‘Alalā pan trap, Chal 05 JEH, 14 Mar 2000, P. Oboyski *et al.*, USNM.

Etymology. From the Hawaiian *winiwini*, sharp point (as of a nose), referring to the elongate clypeus.

Distribution. Restricted to the Pōhakuloa–Humu‘ula region in dry to dry-mesic forest.

***Sierola zimmermani* n. sp.**

Figure 109, Map 21

Island. Hawai‘i.

Diagnosis. Among species with a sharp clypeal carina and densely setose basal wing cells, easily recognized by the somewhat narrow and flattened head (weakly convex above and below, DH/LH ~0.51, WH/LH ~0.80) and conspicuously setose frons, the setae distinctly longer than the flagellum width. Closest to *S. gracillima* Fullaway of O‘ahu, but that species has the frons setae very short and punctation sparse.

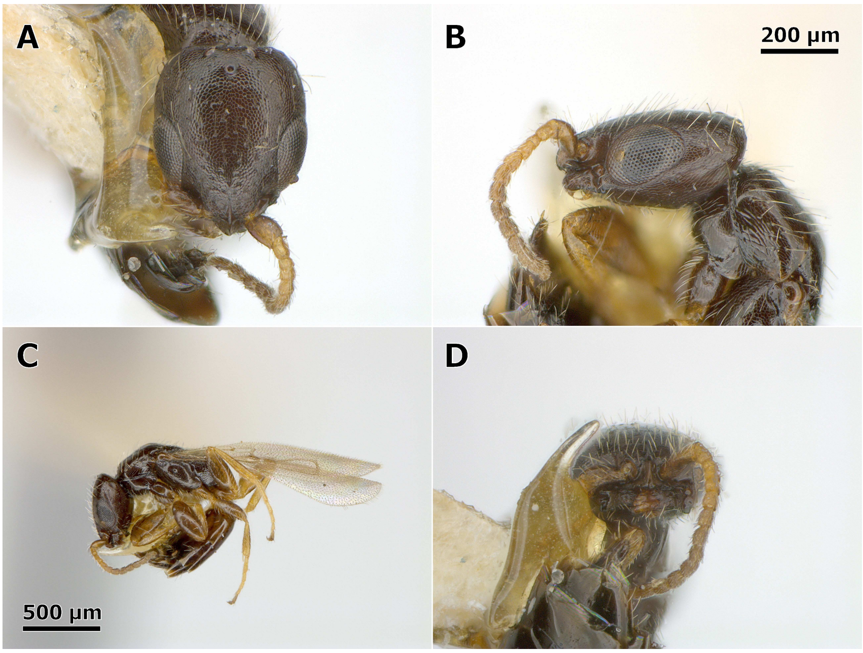


Figure 109. *Sierola zimmermani*. A: head, dorsal. B: head, lateral. C: lateral habitus. D: head, frontal.

Description. **Female**. *Head*. Clypeal process rounded triangular, apex rounded; dorsally with a sharp carina; in profile evenly curved from base to apex, apical angle slightly acute. Mandible moderately narrow, slightly narrowed medially from base, ventral margin weakly concave; apical half of mandible strongly convex outwardly, teeth arrayed on frontal and dorsal surfaces, outwardly coriaceous, somewhat dull; in ventral view evenly, moderately curved. Apex of mandible vertical, with teeth distinctly stronger ventrally. Malar space very small. Dorsal setae of head distinctly longer than flagellar width. Frons with shallow punctures, dense near antennae, 2–3 pit widths apart posterior of midpoint of eyes. Vertex and gena setae conspicuous, nearly twice as long as setae of frons and stronger, erect and directed anterior. Frons microsculpture coriaceous, matte but without strong surface texture. Vertex in dorsal view more or less straight; occipital margin narrowly rounded. Lateral ocelli nearly touching vertex crest. Ocellar triangle front angle weakly obtuse. Head more or less parallel-sided for some distance posterior to eyes. Dorsum of head in lateral view slightly convex, head deepest on line through posterior margin of eye. Venter of head posterior to mandible convex in lateral view, with relatively sparse setae. Head weakly convex ventrally, genal angle absent. Side of head posterior to eye with a line of smooth tesselate microsculpture extending from posteroventral margin of eye to vertex crest, distinctly different from smoother sculpting dorsally and ventrally. Gena ventral to eye flat. Postgenal depression absent. Antenna extending to posterior margin of pronotum.

Mesosoma. Anterior margin of dorsal pronotal area in lateral view evenly rounded, pronotal disc distinctly flattened. Pronotal setae longer than flagellar width. Propodeal disc laterally coarsely striate; metapleural carinae complete. Fore femur only moderately expanded, more than twice as long as wide, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with faint microsculpture laterally.

Color. Body entirely dark brown to black. Antenna brown on base of scape and apical flagellar segments, yellow medially. Mandible black. Coxae and femora dark brown to black, tibiae dark brown, trochanters, tarsi, and bands at bases and apices of tibiae orange.

Wings. Membrane tinged with yellow. Basal cells of fore wing densely and conspicuously setose. Cell 1M weakly convex posteriorly, corner posteroapical.

Measurements. LFW 1.48 mm; LM 0.75 mm; WH/LH 0.80; DH/LH 0.51; EV/HE 0.83; EV/WF 0.73; WF/HE 1.14; WH/WF 1.67; OOL/WOT 1.25; DM/LM 0.37; FL/FW 2.14; HFL/HFW 2.44; A3 L/W 0.92; 2R1 L/W 2.92.

Type Material. Holotype ♀. Hawai‘i: near Humu‘ula, *Sophora*, 7 Aug 1946, E.C. Zimmerman, BPBMENT 0000018140.

Etymology. Named for the collector, Elwood C. Zimmerman, one of Hawai‘i's most distinguished entomologists.

Distribution. Known only from the unique holotype, collected in 1946. May be restricted to the Pōhakuloa–Humu‘ula region.

ACKNOWLEDGEMENTS

Many people helped make this work possible. For assistance with visiting collections and borrowing specimens, I thank David Notton at the Natural History Museum, London; Seán Brady and Matthew Buffington at the Smithsonian National Museum of Natural History; Douglas Yanega as the University of California, Riverside; Janis Matsunaga at the Hawai‘i Department of Agriculture; and Daniel Rubinoff and Kyhl Austin at the University of Hawai‘i Insect Museum. Thanks to Daniel Gruner of the University of Maryland and Bob Peck of the U.S. Geological Survey Pacific Island Ecosystems Research Center for specimens. Collecting permits were obtained thanks to Betsy Gagné, Steve Bergfeld, and Charmian Dang of the Hawai‘i Division of Forestry and Wildlife, and Nicholas Agorastos and Lisa Shizuma of DOFAW’s Native Ecosystems Protection and Management program were invaluable in assisting my fieldwork under DOFAW. I especially thank the current and former entomology staff of the Bishop Museum, Neal Evenhuis, James Boone, Keith Arakaki, Tracie Mackenzie, and Shepherd Myers, for facilitating my work there over the years it took to produce this monograph; and the security staff of the Bishop Museum, who graciously put up with my late hours working there. A special mahalo nui to Kaia Kong for sharing her mana‘o with Hawaiian names. Finally, I am particularly grateful to Cynthia King of DOFAW-NEPM for supporting and facilitating so much of my work over the years, which has led to this project among others.

REFERENCES

Ashmead, **W**.**H**. 1901. Hymenoptera Parasitica, pp. 277–364. *In* Sharp, D. (ed.), *Fauna Hawaiiensis*, vol. 3. Cambridge University Press, Cambridge, United Kingdom.

Atlas of Living Australia. 2011. Open DELTA. Available at: https://github.com/AtlasOfLivingAustralia/open-delta [Accessed 15 March 2024]

Blackburn, **T**. **& Cameron**, **P**. 1886. On the Hymenoptera of the Hawaiian Islands. *Proceedings of the Manchester Literary and Philosophical Society* **25**: 134–183.

Cameron, **P**. 1881. Notes on Hymenoptera, with descriptions of new species. *Transactions of the Entomological Society, London* (4) **14**: 555–577.

Carson, **H**.**L**. 1982. Evolution of *Drosophila* on the newer Hawaiian volcanoes. *Heredity* **48**(1): 3–25.

Clague, **D**.**A**. 1996. The growth and subsidence of the Hawaiian-Emperor volcanic chain, pp. 35–50. *In*: Keast, A. & Miller, S.E. (eds.), *The origin and evolution of Pacific island biotas, New Guinea to Eastern Polynesia: patterns and processes*. SPB Academic Publishing, Amsterdam.

Dallwitz, **M**.**J**. 1980. A general system for coding taxonomic descriptions. *Taxon* **29**: 41–46.

Dallwitz, **M**.**J**., **Paine**, **T**.**A**. **& Zurcher**, **E**.**J**. 2000. User’s Guide to the DELTA System: a General System for Processing Taxonomic Descriptions. 4th edition. Available at: https://www.delta-intkey.com [Accessed 15 March 2024]

Fullaway, D.T. 1920. New species of *Sierola* with explanatory notes. *Occasional Papers of the Bishop Museum* **7**(7): 57–159.

Hadley, A. 2010. CombineZP - Free image stacking software for depth of field correction. Archived at: https://github.com/Vincentdecursay/CombineZP [Accessed 15 March 2024]

Johnson, M.A., Pillon, Y., Sakishima, T., Price, D.K. & Stacy, E.A. 2019. Multiple colonizations, hybridization and uneven diversification in *Cyrtandra* (Gesneriaceae) lineages on Hawai‘i Island. *Journal of Biogeography* **46**(6): 1178–1196.

Lankester, E.R. 1906. *The history of the collections contained in the natural history departments of the British Museum*. Vol. II. William Clowes and Sons Ltd., London. 782 pp.

Magnacca, K.N. 2019. Review of the type specimens of Hawaiian *Sierola* Cameron (Hymenoptera: Bethylidae) at the Natural History Museum, London, with lectotype designations. *Bishop Museum Occasional Papers* **126**: 23–30.

Magnacca, K.N. 2020. Review of *Sierola* Cameron (Hymenoptera: Bethylidae) of the Hawaiian Islands. Part 1: O‘ahu. *Bishop Museum Bulletin in Entomology* **14**: 1–311.

Nixon, K.C. & Wheeler, Q.D. 1990. An amplification of the phylogenetic species concept. *Cladistics* **6**(3): 211–223.

Wheeler, Q.D. & Platnick, N.I. 2000. The Phylogenetic Species Concept (*sensu* Wheeler and Platnick), pp. 55–69. *In* Wheeler, Q.D., & Meier, R. (eds.), *Species concepts and phylogenetic theory: a debate*. Columbia University Press, Chichester, New York.